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THE SOUTHERN PLANTER

DEVOTED TO

AGRICULTURE, HORTICULTURE, LIVE STOCK AND THE HOUSEHOLD.

T. W. ORMOND,	-	-	-	-	-	PROPRIETOR.
W. C. KNIGHT,	-	-	-	-	-	EDITOR.
W. C. JACKSON,	-	-	-	-	-	ADVERTISING AGENT.

45th Year.

JANUARY, 1884.

No. 1

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Agriculture is the nursing mother of the Arts.—XENOPHON.
Tillage and pasturage are the two breasts of the State.—SULLY.

T. W. ORMOND,	-	-	-	-	-	-	-	PROPRIETOR.
W. C. KNIGHT,	-	-	-	-	-	-	-	EDITOR.

45TH YEAR.	RICHMOND, JANUARY, 1884.	No. 1
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FARMERS AND FARMING IN VIRGINIA IN THE OLDEN TIME.

No. 18.

- [1. Letter from Gen. J. H. COCKE, dated 1818, on manuring wheat.
2. Letter from Judge HOLMES, of Winchester, dated 9th February, 1820, on the subject of stone fences. This may interest our readers in the Valley.
3. Letter from PETER MINOR, Esq., dated May 8th, 1820, on the subject of an implement for gathering clover seed.]

BREMO, 1818.

To Peter Minor, Esq., Secretary to the Albemarle Agricultural Society:

Sir,—The following account of a manuring for wheat upon fallows I have thought worth giving to the Society, being persuaded that facts accompanied with a detail of all circumstances likely to influence results, a more valuable kind of information than the most ingenious commentaries.

In the summer of 1817 I fallowed eight acres of poor high land, known in this part of the country by the denomination of barrens, and, unaided by manure, I think would not have produced more than eight bushels to the acre with the most favorable season. Having but the small quantity of manure that was made upon the farm and an adjoining plantation, between the time of carting out the contents of the farm-yard in the Spring and the season of wheat sowing (tho' it is proper here

to remark, that it was chiefly of the strongest kind, the greater part of it being made from the stables), I determined it was safest to err rather upon the side of giving it too much than too little extension. I therefore checked off the land with a plough $23\frac{1}{3}$ yards by $17\frac{1}{2}$, putting a load into the centre of each square, which gives precisely 12 loads to the acre. The manure was carried out just in time to plough it in before seeding. The cart used carried between 25 and 30 bushels only at a load. The manure was better rotted than it usually is at this age from being placed in a stercory, which kept it moist with the muck water that settled at its bottom. The seeding was commenced on the 5th of October and finished on the 7th, put in with harrow on the second ploughing. Seeded one bushel to the acre, and the produce was twenty bushels to the acre. The wheat was of the kind known with us under the name of the yellow bearded.

Yours respectfully, J. H. COCKE.

WINCHESTER, February 9th, 1820.

Dear Sir,—Reading this morning your letter to the President of the Albemarle Agricultural Society on the subject of stone fences, and being engaged myself in improving my farm, as you are, by making stone fences, I have supposed that a communication of my experience might be useful to you and through you to the public. To the advantages which you have enumerated may be added lessening the blacksmith's account, and when your fences are complete, throwing more land into cultivation by clearing that which you don't want for rails or fuel. My farm contains 900 acres of rich limestone land, 600 acres cleared and 300 in wood; when I shall have surrounded it with a stone fence, I can without a violation of the proper proportion of arable and wood land, clear 100 acres more; the product of this 100 acres, besides the value of the wood, I place to the credit of the stone fence. I have made a great deal of stone fence, but have never, until within the past year, made any that did not fall down in the winter and spring, by reason of bad construction and the distension and subsiding of the earth by frost. If I don't succeed in describing my new fence so that you can understand me (and I fear I shall fail on account of my awkwardness at a diagram), you must come and see it, and I need scarcely add that I shall be very happy if you will do so. My fence was built by a Scotchman who came over about two years since and is now living on my land and building stone fence.

He brings with him all the late improvements in Scotland on this fence. The foundation is dug $2\frac{1}{2}$ feet wide and 6 inches deep, filled to the surface with small stone.

He then places stones on the edge of the foundation that will reach beyond it about 6 or 7 inches, resting on the ground, and covering the foundation with small stone 7 or 8 inches. He then starts the wall upon the horizontal line A B, hearts it well, as he calls it, in its ascent, but at the height of 18 inches he puts on a binder that reaches from side to side of the wall, as at c. c.; these binders are one yard apart, the whole length of the wall. He builds 18 inches higher and runs through another binder, not immediately above those laid at the first 18 inches, but in the centre between them, so as to form a triangle. He caps with stones that reach across the wall, which is only a foot at top; two stones one over the other compose the cap. I asked the workman of what advantage was the jutting over of the bottom; he answered (as is customary among many of his countrymen) by asking another question: Don't a man stand more firm by extending his legs Δ , than when his feet are close together $||$? I have detected a great error in the information communicated to you by Mr. Moore. He says dig no foundation and let no stone go through until the last course. I have built some fence without a foundation, and am obliged every spring to rebuild most of it, and you see in my improved fence I have three binders in every longitudinal yard, besides the two top stones, and so disposed as to bind from top to bottom. Suppose you start the wall $2\frac{1}{2}$ feet thick and batter it up to a foot at top, would a stone of *one foot* at the *top* bind the two feet work near the bottom?

You are correct in stating that a stone fence is the cheapest. Let us compare it with the cheapest and most worthless—the common worm fence. Rails sell here for \$5 per one hundred; to make one rod of this fence you must have 25 rails worth \$1.25, exclude the labor of putting it up, and various other items, but keep in view the idea of permanency. My improved stone fence costs me \$1 per rod, and the workman finds himself. When I don't employ my own carts, I hire the hauling of the stone at 66 cents per rod, that is \$1.66 per rod; it will last forever, and the workman says it is considered a bad fence in Scotland if there should be a gap found in it within forty years after it is built; but in forty years, besides upsetting, the worm-fence will require at least three, if not four, renewals, and it is fair to add this additional expense of three or four dollars per rod

to the original cost of the worm fence when we are comparing it with a permanent fence.

I congratulate you, dear sir, on the prospect before us of great improvement in the science of agriculture and the implements of husbandry. The agricultural societies will be the means of collecting much valuable information, and that excellent paper, the *American Farmer*, printed at Baltimore by Mr. Skinner, will be a prompt agent in diffusing it. If you are of opinion that this letter would be of any service to the public, you may send it to Mr. Skinner. Very respectfully,

Your obedient servant,

H. HOLMES.

Peter Minor, Esq., of Albemarle.

I present, for the inspection of the Society, a simple implement for gathering clover seed, which I used last summer with great advantage and success. It combines no new principle in the construction different from several others in common use; nor is it of recent invention, for I remember to have seen one similar to it twenty years ago; the recollection of which induced me to have some made last summer when from the excessive drought which prevailed throughout Virginia our clover did not get high enough to cut. It is recommended for the simplicity of its construction and cheapness (the entire cost not being more than 75 cents), the ease with which it is worked, and the astonishing expedition and success which attends its use. A neighbor of mine and a member of this Society, gathered last summer with one exactly similar to the present model, 100 bushels in a day commencing after the dew was off. But it must be mentioned that the clover stood very thick and erect, and the heads were perfectly full and in fine order for pulling. A few days succeeding, after a heavy rain, which beat off a great deal of the seed and tangled the clover, in the same field and with the same machine I could not gather more than 60 bushels. The man who works it should go regularly through the field in rows, as he would in mowing, and he will carry about as wide a row as he would with a scythe. In making from 6 to 12 strokes he will get so much as to require the comb to be emptied. A small boy with a large hamper or basket should attend his steps for this purpose, and the boy can wait upon two gatherers. As the hampers get full they should be emptied into a cart, which must attend to remove the seed to the place of keeping.

I have seen a machine upon this principle, fixed on low wheels and drawn by a horse, a cut and description of which is given

in the *American Farmer*, page 253, vol. 1st. The objections to the horse-rake are, that the horse beats down a quantity of the seed, and if stumps or stones intervene, you must deviate from a straight course, thereby missing a great many heads, and the operation of emptying the box is tedious and attended with waste. A gentleman who used the horse-rake, saw my *Hand-Combs*, as I call them, at work, and gave them a decided preference, both for expedition and effectual performance. The combs will work around a stump or stone as easily and as effectually as a grass scythe, and although they strip the heads perfectly clean, yet a sufficiency of seed falls to the ground in the operation to renew the crop of clover if the ground is intended for a fallow.

P. MINOR.

A HINT.

There is more merit in the common cows of the country than they get credit for. Give them the same pampering that the thoroughbreds get, and the thoroughbreds the scanty, bare and hard treatment the common stock get, and a few generations will suffice to bring them both to the same level. The thoroughbreds are what they are from good food and good treatment.

How readily the common cows respond to a little more generous supply of food than they are accustomed to enjoy, is well illustrated in the experience of the present season. Favored with an abundance of rain to make flush pasturage, the cows which depend wholly on grazing have been better supplied with food than they usually are, and the result is something like 25 per cent. more butter and cheese than they are accustomed to make in the first half of the season. Their products are always large when the season is favorable for an abundance of grass, but when in the vicissitudes of the weather the heavens are less generous, and drought makes feed unfortunately short, milk and its products dwindle to the opposite extreme, and there are loud complaints of the "scrub cows," and the owners begin to look round for better breeds. It is a good idea to look for a better breed, but it will require a pretty sharp lookout to find a breed of cows that will give full returns from half-fare, or do any better than the so-called "native" cows when there is a lack of food to make milk from.

When our dairy friends have such ample opportunity for witnessing the difference between full and scanty rations, why can't they utilize the hint and see to it that their herds have full fare all the season, whether the heavens smile or frown. A little comparatively inexpensive preparation for soiling with green food in case pasturage should be scanty, would meet any emergency and secure returns so generous and uniform, that instead of despising his cows it would inspire an inclination to admiration and gratitude.—*Rural New Yorker*.

SOILS PRACTICALLY CONSIDERED.

(Continued from page 590, December number)

II.

DRAINAGE—ITS IMPORTANCE AND EFFECTS.

Of all the mechanical operations of the farm, this is the most important, because a large proportion of the best farming lands require it. Its importance was recognized by the Romans; and Cato, Columella and Pliny all mention draining, and some of them give minute directions for making "*under-drains*" with stones, branches of trees and straw. *Draining is necessary for all cultivated land that is not naturally under-drained.* The necessity for drainage does not depend so much upon the quantity of water which falls or flows on the land, nor upon the power of the sun to carry it off, by evaporation, *as upon the nature of the subsoil.* With a subsoil of sand, gravel or other porous earth, the water not evaporated passes off below, by natural drainage. With a subsoil of clay, rock or other impervious layer, the downward course of the water is stopped; it becomes stagnant, rises to the surface, or bursts out as springs. If the water which falls on the surface of an acre in the course of a year was removed by evaporation alone, the soil would be absolutely barren, on account of its coldness. The rain-water which falls on cultivated lands in part flows into the streams, either upon the surface or by percolation through the soil, passes off by evaporation, and partly enters into the constitution of plants. A great deal of land is drained naturally, so that the proportion of water which passes off by evaporation is not injurious. But a much larger proportion is not "nature-drained," and cannot be made productive without artificial drainage. Whether drainage will prove profitable or not depends on the value and character of the land, as well as the nature of the soil, as to productiveness when drained. Lands that require drainage and pay best are river bottoms, or low grounds, branch flats, meadows, and all high lands with strong clay soils. Each kind requires drainage specially adapted to it. But "careful observation will soon teach any intelligent farmer what parts of his land are injured by water; and having determined that point, the next question should be whether the improvement by drainage will justify the cost of the operation." It should be borne in mind that drainage is a permanent investment, and the question should be, will the increased profit of the land drained be permanent enough to pay a fair interest on the cost of

the improvement? Experience both in England and this country shows that the increase of crops by tile-drainage is from 25 to 30 per cent., and has proved universally profitable.

There are various methods of drainage—(1) Open ditches are most commonly in use in this country. They furnish the most obvious means of getting rid of the surface water, and perhaps the cheapest method; but there are grave objections to them. They are not permanent, and require constant care and labor to preserve them in proper condition. They obstruct the operations of the farm, as ploughing, mowing, and the laying out of the land for convenient cultivation. They occupy too much space, and furnish channels for the washing off of the manures and fertilizing principles of the soil, while they drain the subsoil very imperfectly. (2) Secret or under-draining by means of brush, poles, plank, rocks, and tile drain-pipes, comprise the methods mostly in use. The ditches being cut from 3 to 4 feet, brush is put in, laid butt-end up stream, then poles are laid on, and the whole is covered with earth. Where the wooden mass is kept constantly wet, it may last for some time, but the wood generally rots in three or four years, and the earth caves in and produces obstructions, rendering the drain useless. Pine poles are used for the same purpose, applied so as to have one resting on the two applied on the bottom. If economy, durability and thorough drainage are the main considerations, tiles combine these qualities better than anything else. For, although rocks and planks are both cheap and durable material, the durability of their use in drains is a very different matter. But we would by no means discourage the use of rocks and planks where tiles cannot be obtained at fair prices, especially where the materials are often close at hand. Every farmer should estimate the cost of draining by these different methods before the work is undertaken; but we think, that with the present prices of labor, the tiles will be found the cheapest in a majority of cases. The different forms of tiles in use are the horseshoe tile, the sole tile, and the round tile, of different sizes and lengths. We prefer the round tile, because they are stronger, less expensive, and discharge the water better than the other kinds. They may be used with collars to join them at the ends, or simply applied end to end in straight lines, and kept in place by the earth on each side. The sizes in common use are 2, 4 and 6 inches. The 2-inch tile is the one most used, and the 4 inch for main ditches, or outlets. Elbows and joints are also used with all these sizes when required. A 2-inch round pipe with a fall of 1 foot in 100 feet, will have a velocity per second in feet 1.71, and a discharge of 22,891.1 gallons in 24 hours. A 4-inch pipe,

with the same fall, will have velocity 2.13, and a discharge of 86,181.4 gallons in 24 hours. The distance at which the drains are put apart must depend upon the nature of the subsoil, the fall and the depth of the ditch. In wet lands, with heavy clay subsoils, from 28 to 30 feet apart, and $3\frac{1}{2}$ to 4 feet deep, will be about the best proportion. In ordinary cases, 42 feet apart and 4 deep will be sufficient. The direction of the drains should always be in the line of the steepest descent, or greatest fall, as essential to effective and economical drainage. It is therefore of the greatest importance that the levels should be carefully obtained by means of an accurate survey, with proper instruments, before the work is undertaken. The arrangement of the drains must not only have reference to the *fall*, but to the nature of the *outlet* as well. In regard to the extent of the fall, Stephen says, "It is surprising what a small descent is required for a flow of water in a well constructed duct;" and French says, "That he knew of a swamp being drained and converted into a garden with drains of but 3 inches fall in every 100 feet; and another instance in which he found a fall of $2\frac{1}{2}$ inches to the 100 feet sufficient." Whatever may be the nature of the surface, it is always advisable to divide the fall as evenly as possible throughout all the drains, and to have the main drains from 3 to 6 inches lower than the drains discharging into them, so that there may be no obstruction from the backing up of water, and the deposition of sand during heavy floods. In short, the drains must be cut as straight as possible, and have a constant, regular and equal fall to the outlet.

The outlet of tile drains is the place of all others where obstruction is most likely to occur. The outlets, therefore, should be arranged in a permanent and substantial manner, by means of bricks or stones around the point of discharge, as well as inspected carefully from time to time, in order to remove any obstructions that may occur from the tramping of cattle, the burrowing of reptiles, cray-fish, &c. Gratings or screenings may be used, but they also obstruct the flow too much, by catching the sediment. Wells or openings with traps in the course of long drains may be used, but I have never found them necessary. If a pipe is broken, or becomes displaced, or obstructed, the fact and the location are soon made known by the wet area immediately over the point of dislocation or fracture, and the remedy is readily applied by putting in a few new pipes carefully adjusted.

The cost of under-draining with pipes or any other material will depend upon the cost, weight and freight of the material, the price of labor, and the nature of the land drained, as well as laying out or engineering. The under-draining done on the Experimental Farm has

cost an average about of $7\frac{1}{2}$ cents per yard, with 2-inch pipes, made on the farm. If the freight had been added to the prime cost of the pipes, the amount would have been increased. The number of tiles required to the acre will depend upon the intervals between the drains, in feet, and the length of the pipe, in inches. With an interval of 30 feet between the drains, and the use of a 2-inch pipe 12 inches long, the number of pipes required for an acre will be 1,452. The same pipes laid at intervals of 42 feet between the drains will require 1,037 per acre. If the pipes are laid 4 feet deep, the interval of 42 feet between the drains is fully sufficient in all ordinary cases. To recapitulate, the elements of computation of the cost of under-draining are, the price of labor, the price of pipes and the freight on them, the character of the subsoil, the depth of the drains, the distance apart, and the incidental expense of the laying out and making the outlets. The mode of procedure in laying, securing joints and covering the pipes, is not difficult, although it requires a careful and steady laborer to do the work properly. The pipes are laid end to end and connected by collars, or a piece of broken pipe is laid directly over the joint; the clayey earth is then thrown carefully on each side of the pipes to hold them steadily in position, until the earth is placed over them to the depth of 12 or 14 inches, and then the filling in is done afterwards. In England tan bark, sod and straw were formerly placed over the pipes, but the practice is now entirely abandoned.

Where under-draining is impracticable, great benefit may be derived by the judicious location of open ditches and surface drains. In all cases, the lands should be carefully surveyed, in order to obtain the true line of descent or fall for the open ditches, which should be cut strictly in accordance with this line, and as straight as possible. The surface drains, or "water furrows," may be made with the plow in accordance with these principles, and should lead directly into the open ditches. There are several ploughs made especially for this purpose, called *drain-ploughs*, as Routts, &c.; but an ordinary plough is generally all sufficient. Great neglect is often shown in the careless way in which water furrows are run, and in not having them lead directly into the open ditches. Waring, in his admirable little work on the "*Elements of Agriculture*," sums up the advantages of under-draining as follows:

- "1. It greatly lessens the injurious effects of drought.
2. It admits an increased supply of atmospheric fertilizer.
3. It warms the lower portions of the soil.
4. It hastens the decomposition of organic matter.

5. It accelerates the disintegration of the minerals of the soil.
6. It causes a more even distribution of plant food.
7. It improves the mechanical texture of the soil.
8. It tends to prevent grasses from 'running out.'
9. It enables us to deepen the surface soil.
10. It renders soils much earlier in Spring.
11. It greatly lessens 'heaving by frost' and 'Winter killing.'
12. It allows to work sooner after rains.
13. It prevents the effects of cold weather in the Fall.
14. It prevents the growth of sorrel and noxious weeds.
15. It hastens the decay of vegetable matters, and promotes the finer comminution of the earthy particles of the soil.
16. It prevents the excessive evaporation of water and the consequent cooling of the soil.
17. It promotes health by the removal of the causes of disease in man and domestic animals."

In fact, it is the *sine qua non* of all successful and profitable farming.

In hilly lands, with wet, soggy, or weeping areas, on the hill tops or on the slopes, drainage is often necessary. This is generally due to some peculiarities in the stratification of the underlying bed rocks. Intractable, barren areas of various sizes are often produced by excessive wetness, resisting even the repeated application of top-dressings of manure. The cheapest form of drainage in all such cases is to sink pits in the midst of such areas, below the overflowed stratum, and fill with rocks from the surroundings, and cover with earth to the depth of 3 or 4 feet, so as to take the water off between strata too low to interfere with the surface soil.

III.

PLOUGHING AND SUBSOILING.

Ploughing deep into the subsoil is labor thrown away, unless the land is well drained, because the rains of a single season overcome its effects by packing the deep layers down into their former condition. But after the land is thoroughly drained, it is productive of the best results, because it admits atmospheric air, allows the roots of plants to ramify, disintegrates the mineral silicates, and promotes chemical action in all its phases. The object of deep ploughing and subsoiling is to deepen the soil or tilth, to enlarge the seed-bed and to admit the roots of the plant to a greater depth, to obtain the nutriment necessary to its growth, to increase the moisture from the lower portions of the soil,

and to enable the plant to assume the form requisite for its greatest development. The ability of roots to perform their functions in the soil and to grow to the largest size depends greatly on the condition of the subsoil. Cold, impenetrable subsoils are not only mechanically, but chemically inimical to the growth and ramification of the roots of plants. In all conditions of this kind, under-draining, deep ploughing or subsoiling are absolutely necessary to render the land remunerative. Subsoils of this character, when brought to the surface, may be unproductive for the first year, because it requires some time for the particles from this lower stratum to be aerated, oxygenated and weathered; but the beneficial effects are soon seen in the perennial improvement. For this reason, it has been recommended to plough an inch or two deeper every time the land is broken up in the rotation. For ordinary lands this is a very excellent plan. With a proper subsoil plough, however, the subsoil may be broken without bringing what the farmers call "the dead earth" to the surface. In using the subsoil plough, it should follow in the furrow immediately behind the ordinary plough, and it should be so shaped as to penetrate the subsoil as deep as practicable, and *burrow* it up like a mole, rather than turn it up over the surface. In this way the hard, impenetrable subsoil is broken and made loose, with the greatest benefit to the crop. Heavy clay soils should always be ploughed in the Fall, so as to expose them to the freezing and thawing of Winter, which aerates and pulverizes them in a way affected by no other process. Light sandy soils may be more advantageously ploughed in the Spring, as they are apt to leach during the Winter rains, and are generally sufficiently porous for all the crops grown on them.

The advantages of deep and subsoil ploughing are, that they make the seed-bed deeper and finer for the ramification of the roots; fix them more firmly; secure under-drainage; prevent the evil effects of drought; insure permanent improvement of the land, and largely increased production. The other processes of pulverizing the soil, as harrowing, cultivating, coultering, rolling, &c., are all important, but are entirely subsidiary to thorough ploughing during the right season, with the land in proper condition.

No land should ever be ploughed or worked wet. Land ploughed too wet never recovers from it during that season, and rarely produces a crop equal to its natural capacity. When the furrow turns from the mould-board of the plough in a compact form, and presents a glazed or sleek appearance, the land is apt to be too wet, and when the excess of water evaporates, it not only leaves the land cold, but the furrow

hard and baked into a compact mass, which, when harrowed, breaks up into dense clods, more or less impenetrable to moisture and air the balance of the season. This may be overcome, to a certain extent, by freezing and thawing during winter, when the land is ploughed in the fall; but even this is an equivocal remedy.

If the land is level, it should be ploughed in the direction of the line of greatest descent or fall, in order to secure the best drainage. Hilly and rolling lands should be ploughed horizontally, with the same object in view, taking care to avoid too great fall or descent in the furrows. Level lowlands may be ploughed in beds, with great advantage to secure surface drainage, and the width of the beds may be suited to the character of the land and the objects in view in regard to the crops cultivated. Beds five, fifteen, twenty, and twenty-five feet have been advocated and used in the tidewater counties of Maryland and Virginia for a long period. Great care should be observed when these beds are ploughed by reversing them, not to have them too low or too high in the middle; but this is a matter of practice soon acquired.

IV.

MANURES IN THEIR RELATIONS TO VEGETABLE PRODUCTION.

Having examined into the nature of the soil; its *earthy* constituents; its relations to heat, light and moisture, as well as the methods and remedial effects of drainage and ploughing, I pass on to consider manures and their practical effects on the soil in promoting vegetable production.

Manures may be divided into three classes, viz., mineral, organic, and atmospheric. Having considered the last class in the former part of our course, our time now will be occupied with the two first.

Mineral manures are believed to have four modes of action when applied to the soil, concisely stated by Waring as follows:

- 1st. They furnish food for the mineral or inorganic part of plants.
- 2nd. They prepare matters already in the soil for assimilation by roots.
- 3rd. They improve the mechanical condition of the soil.
- 4th. They absorb ammonia.

Mineral manures do not necessarily produce all of these effects at one and the same time. Some produce only one, perhaps, while others produce two or more of them. Of those which are used as food for plants, the *ash* reveals the most important; and we have seen that the *ashes* of plants of the same kind are always of very nearly the same composition, while the ashes of different kinds may vary very consid-

erably. Different parts of the same plant even are supplied with different kinds of ash ingredients. The clover plant, when burned, furnishes an ash containing lime in large proportion, while potatoes leave potash in large proportion. These considerations have an important bearing in practice, not only in effecting the fertility of land directly, but in making a rotation of crops a necessity in general agriculture.

According to Professor Anderson, of Scotland, a wheat crop [grain and straw] removes from the soil 98 lbs. of silica; a crop of turnips only 4 lbs.; wheat crop from 17 to 37 lbs. of potash; turnip crop 112 lbs. per acre. Wheat removes only 4.7 lbs. of sulphuric acid; turnip crop, 40 lbs. per acre. Wheat requires only 19 lbs. of lime and magnesia, while a clover crop requires over 135 lbs. These substances must all exist in the soil in soluble form in order to be taken up by the roots of the plant. When we apply unleached wood ashes, we furnish all these minerals in the best possible proportions for the plant.

The practical deductions to be drawn from these observations are—
1, That the soil must be supplied with all the mineral matters absorbed as plant food in sufficient quantities, and in soluble form, for the highest production. 2, That great economy is gained by having crops of different classes to alternate with one another which is known as a rotation of crops. In this way the minerals, which serve as food for plants, are, so to speak, economized in the soil. Mineral manures not only serve as food for plants, but they render available the matters already contained in the soil. It is in this way, that the alkalies render the silica of the silicates of the soil, soluble in water; and lime causes particles to crumble and expose their constituents to the demand of the roots. One of the chief offices of lime, therefore, is the development of the fertilizing ingredients of the soil. Mineral manures also improve the mechanical condition of the soil. The alkalies, and alkaline earths, break up the mineral silicates, combine with the silica and alumina, produce a pulverization of the particles of the soil and promote porosity. Minerals, such as plaster and salt, have the power of absorbing moisture from the atmosphere and thus improve the mechanical condition of the soil. Some mineral manures have the power of absorbing ammonia. The most important of these are plaster, lime, alumina, or clay, and the oxides of iron, which absorb ammonia, whether arising from the fermentation of animal or vegetable matters in the soil or washed down from the atmosphere by the rains.

The deficiency of any one or more of the ash elements of plants renders the soil infertile or barren, until the missing substances is supplied. These minerals, in many cases, may be actually present in the

soil, but are bound together in such close combination as to be entirely insoluble, and utterly useless to the plant. Under these circumstances the deficiency must be artificially supplied by the necessary minerals, or the insoluble combinations be broken up by the application of proper agents, as lime in its various forms. Fortunately ordinary soils contain a sufficient amount of all the ash elements of plants except potash, lime, and phosphorus; and it becomes necessary to supply these substances, as well as nitrogen, liberally to most of our cultivable soils, in order to secure the highest production.

Potash may be applied in the form of unleached wood ashes, ten or fifteen bushels per acre, sowed broadcast on the land when it is prepared for the crop. The kainit or German potash, is another form which supplies this mineral, along with magnesia and soda in fair proportion, or it may be supplied in the form of sulphate and muriate, prepared from the crude kainit or Stassfurth salt. A better plan is to apply the potash in the form of one or the other of the above compounds, mixed with phosphate of lime, finely ground or pulverized. The German potash salts, mixed with a fourth larger amount of fine ground phosphate or bone furnish all the necessary ash elements of cereal plants in excellent proportion. The mixtures may be used after being composted with manures, vegetable matters, &c., or mixed with equal parts of alluvial or dry earth. They should be applied before the seeds are sown and well mixed with the soil by the harrow or cultivator.

SEED BREEDING.

Perhaps no department of farming needs so careful attention as that of the breeding and selection of seed. The seed is the parent of the plant—and bounds its possibilities—possibilities that vary widely with the seed. So critical an observer as Dr. Sturtevant has given facts upon which he seems to rest a belief that seed is capable of making as wide a difference in product as the use of manure against unmanured land. We find that laws of heredity are as potent in plant as in animal life, and respond as fully to the breeder's art, under crossing and selection. To secure the best seed is of more importance to the farmer and the country than it is to secure the best breeding stock. The plant precedes the animal and its cost modifies the cost of animal products. The plant food of the country far exceeds the value of our animal products, much of plant food going into direct human consumption. Yet, notwithstanding these facts, far more complete attention is given to improvement. I am aware that new varieties, or pretended varieties, of plants are being constantly put upon the market, get fairly introduced at much cost and then are found to be no improve-

ment, or have become mixed with other seed, or are soon displaced under the cry of deterioration.

In animal breeding the effort has not been so much to produce new varieties as to improve the old. And how? By the selection of the typical animal of a given breed and then the best of his get, or the best to be found. Selection has rarely been pursued in seed breeding of our field crops, excepting corn—imperfectly. When a new variety is put upon the market, if the introducer does not give us every seed produced, the purchaser sows and continues to sow all the seed used without any selection at all, or if at all, the selection is inadequate. It is true that a majority of us do, by the use of separators, obtain the plumpest and heaviest seeds, but in this division we fail of the point desired. We have in the dense and heavy seed combined, no guarantee of several vital factors. In plants grown for seed, seed in quantity and quality is aimed at, and not stem and foliage. Other things being equal, the less of stem and branch the better. Again, profligacy is important—if not all important, a main object to be achieved. Our dense large seeds from the separator may have been grown on a non-prolific plant. However important production of new varieties may be, by crossing, selection of seeds from the plant in the field must be and remain always a most valuable means of maintaining a high standard of excellence. It was by this means that Major Hallett succeeded so well with his pedigree wheat, which he reports to having increased in length of head $4\frac{1}{2}$ inches to $8\frac{3}{4}$, and in seeds per head from 47 to 120.

By this means the wonderful increase in the per cent. of sugar in the sugar beet from Napoleon's day to this, was largely accomplished. Among the Durhams we have the Princess, Duchess, Young Mary's, &c., &c.; why not have lines of field crops of superior excellence? In some respects the analogy may not be perfect, nor is it likely that strains of Timothy will be sold over the country. But why does not some careful farmer select seeds for Timothy plants of superior type and by continued selection fix that type. It may be objected that selection with our lesser field crops is too troublesome a matter. In many directions those things that require much trouble to accomplish are the most profitable to take hold of. Those things required to be done, and that take but little care or skill to handle, are the matters that the masses are doing, and in which there is much competition. This work is a work that pre-eminently needs doing in the West.

Prof. J. W. SANBORN, in *College Farm*.

—Much nursery stock is foredoomed to failure from being grafted on little pieces of roots, and one-year-old seedlings at that. A whole root is none too much for a single graft if a vigorous tree is desired. With many slow growing varieties it is better to have the grafting just above the collar, so that the roots will be on the more vigorous natural stock.

DOMESTIC CHEESE MAKING.

The introduction of the factory system in cheese dairying is fast reducing the domestic manufacture to the condition of a lost art. This is unfortunate, because the home manufacture of cheese is in many cases a great convenience and economy. To help preserve this domes-

tic art, we give a few plain directions for making small cheeses for home use, which any person may follow successfully after a trial or two. The quantity of milk used as the basis of the method here given is 100 quarts or 220 pounds. This quantity can easily be procured by changing milk with two or three neighbors so as to get the requisite quantity on one day, returning it on other days. If the milk of one meal can be procured in sufficient quantity, that is the best; If not, the evening's milk is stirred the last thing at night and again in the morning, when it is warmed up to a heat of 90 degrees. The new morning's milk is then added to it, and both well stirred and mixed and the rennet is then added.

The rennet is made of the dried stomach of a sucking calf. This is taken from the calf and emptied of its contents, some salt is put into it, and salt is rubbed on to the outside; it is then stretched on a loop of bent twigs and hung up to dry and cure. The older the rennet up to 18 months, the better it is. The stomach may be steeped in a quart of salt water for three weeks and the liquor bottled for use; or a piece one inch wide and two inches long may be cut off and steeped in half a teacupful of water for 24 hours for 100 quarts of milk. If the liquor is used, three tablespoonfuls is the right quantity for 100 quarts, and and at the temperature of new milk, or about 80 to 90 degrees, will bring the curd in one hour. The milk is curdled in a vat made of white ash or white cedar: one 3 feet long, $1\frac{1}{2}$ feet wide, and 16 inches deep will be a good size for setting 25 gallons, or 100 quarts, of milk. The sides of the vat should be made a little flaring, and the joints put together with white lead. This vat should be made of seasoned lumber, and should be carefully washed with cold water, and then scalded after use, and then put away in a clear, airy outhouse or dairy room.

As soon as the curd is formed it is cut into slices half an inch thick with a long bladed knife; the curd is then cut crossways, so as to reduce it to squares half an inch each way. It is better to cut it still further into cubes by passing a frame made with fine brass wires set half an inch apart through the cube, so as to divide it horizontally and leave it in small square pieces half an inch each way long, wide and thick; or this may be done, as well as may be, with the knife held in a sloping manner, so as to cross the other cuts. This is done carefully lest the cream should escape from the curd. The curd and whey soon separate, and the whey is dipped off into a pail and heated until the hand cannot be held in it, and then poured over the curd. It is a good plan to have one or two holes bored in one end of the vat and closed by plugs or provided with faucets through which the whey can be drawn off to be heated. The whole curd should be brought up to

a heat of 100 degrees and covered up with a cloth to retain the heat for half an hour. Some whey is then drawn off and heated again and added to the curd, which is stirred so as to warm up every fragment equally. The curd is then left to stand in hot whey and cool for half an hour, when the whey is drawn off and left to cool; after which whatever cream may rise upon it is skimmed off to be churned and kept for rubbing the cheese afterward; and the whey is then put into the slop barrel with some meal for the pigs.

The curd is then left in the vat, heaped in the centre of it, and covered with a cloth for half an hour. It is then broken up with the hands or cut with a knife, turned, and left another half hour, or until it becomes slightly acid to the taste. No more acid than this should be developed. It is then broken up again by the hand, spread to cool, and pressed in a corner of the vat and left until afternoon. It is then broken up fine as possible once more, fine salt is added at the rate of one ounce to three pounds; 100 quarts of milk will make about 21 pounds of cheese, and it is ready for the press. The test of the ripeness of the curd for the press is a squeaking noise when a piece is crushed between the teeth, or when a piece touched to a hot iron, as a hot poker, and withdrawn leaves strings attached to the iron.

The curd is put into hoops as soon as it is salted, and when completely cooled by exposure to the air. The hoop for a family cheese should be about 9 inches deep and 7 inches wide: a cheese of this size will weigh about 10 pounds, and 100 quarts of milk will make two of them. A good hoop is made of the hoop of a common cheese box, cut to the proper size and not fastened at the side, but made so that it can be drawn up by means of a cord fastened to one end of the scroll, and wrapped around it. Such a hoop can be let out so as to make a larger thin cheese, or drawn up for a smaller thick one, as may be desired. The hoop is lined with a piece of thin muslin, the curd is laid in the mold until it is filled, the muslin is folded over the top, a piece of board cut to fit the mould inside is laid upon the cloth, and the whole is put into the press. This consists of a strong bench of three-inch plank at one end, a post is set through the plank and stoutly keyed, a lever is pivoted strongly to this post; the mold with the curd is placed under the lever, a few blocks are placed on the cover of the mold, and the lever is fitted on to the blocks; then a weight, such as a large stone, is hung to the end of the lever, and the pressure is made to bear on the cheese. If a strong screw can be procured and fitted in a stout frame so as to bear on the cheese, that will make a very convenient press. But for an odd occasion, a lever press may be improvised with a strong rail, fastened at one end to something that is firm in the ground, and with a stone hung to the other end, so as to bring pressure upon the cheese placed under the lever near the fastened end. The pressure may be known by multiplying the weight hung on the lever by the number of times the length of the weight end of the lever exceeds the length of the other end. If the cheese is one foot from the fixed end, and the weight six feet from the cheese, and the weight is 100 pounds, the pressure on the cheese is 600 pounds. This

is enough for a small cheese, and half of it might do very well if it is continued twice as long as a heavier pressure. After 24 hours the cheese is taken out, a fresh cloth is wrapped about it, and it is put in press again for another day. This is repeated once more, and after three days the cheese is rubbed with butter (usually made from the cream taken from the whey), is wrapped with a bandage of strong cotton cloth, which is four inches wider than the cheese is thick, and the excess is turned down on the face of the cheese. The cheese is then kept in a cool room on a shelf, and turned every day to ripen. By having two or more molds, as many cheeses may be pressed at once. The cheeses may be ranged side by side, and a square bar is placed over the molds so as to press upon each of them equally, and the lever presses upon the bar. A cheese thus made will be ripe for use in 30 to 90 days. There is no use to follow out this precise plan; this may be modified to suit the circumstances. The chief points to be precisely observed are the temperature of the milk, the quantity and quality of the rennet, and the heating and airing of the curd. Overheating makes the curd hard and poor, and moderate heating, or none at all, will give a rich, mellow cheese. The heating is a part of the Cheddar system; in the Cheshire system the curd is not heated, and the cheese is softer meated than the Cheddar.—*The Dairy*.

PLANTING AND FEEDING THE ORCHARD.

One reason of the lack of success in starting a young orchard on old, worn out lands, is that the necessary care is not taken to deepen the soil and thoroughly prepare and manure it. Another reason is the neglect that the young trees subsequently receive. The young orchard is too often left to take care of itself. The weeds out-rank the trees; no suitable manure is applied, and the land is left unplowed, and the young trees soon give up the unequal contest for life. This should not be. An apple orchard, when cared for as it should be, will pay.

Many claim that spring planting is the best. My experience has been decidedly in favor of fall setting. Perhaps the method of planting, as well as the soil and location, have had their influence. My plan is this: Procure trees direct from the nurseryman who grows them, together with a written guarantee that the varieties are correctly labeled. As soon as received, open the bundle or box. Cut off the ends of the bruised roots and cover the roots of each variety with soil. Dig the places (not holes) for setting them by plowing, with a strong team, deep dead-furrows thirty-six to forty feet apart each way. Fill in with surface-soil, forming a low mound where the tree is to stand and press the roots down in the top of it firmly. Set the tree as deep as it stood in the nursery, for the ground will settle from one to two inches. Lean the tree a little to the south-west, placing the lowest limbs in that direction. If the tree is crooked, put the projecting crook toward the north-east and then lean the top to south-west the same as

if it were a straight tree. Fill up around and over the roots of each tree and firm the soil, and raise a compact mound about each tree to a height of one foot above the general level of the surface. This mound is levelled down the following spring and a small forkful of half rotted straw is put about each tree. Corn is a good crop to grow in a young orchard, as the trees are partly shaded by the corn. The next two crops grown should be potatoes, care being taken to use manures containing a liberal supply of potash, such as ashes.

I do not cut back the top in the fall, but do it as soon as the buds begin to swell in the spring. I give the tree the proper shape by cutting back nearly one half of each limb, about half an inch above a bud that points outward from the centre of the tree. Thereafter, I always keep a sharp knife with me, and at any and all seasons cut out the small limbs that rub against or pass over others.

After fall planting, in order to prevent rabbits from gnawing the bark off the young trees during the winter, I take four or five pieces of cornstalks about three feet in length, set them about the trees, and tie them at the bottom and top with carpet twine. This also protects the tree from drying west winds, or the action of the sun in winter upon the bark of the trees. It also serves to protect the trees the following spring when plowing for growing crops.

As plant food for either a young orchard or an old one, I have found nothing better than wood ashes scattered upon the surface under the trees. If the soil is too close and compact by reason of continued pasturing with stock, as in the case of old orchards, then the sod should be heavily manured, plowed deeply and planted to corn, and then be seeded with wheat and clover as long as possible, and without closely pasturing it. An excellent special manure for an orchard is two hundred weight of fresh, hard wood ashes, sown broadcast after plowing the land. I have found that two hundred pounds of bone dust and three hundred to four hundred pounds of sulphate of potash to the acre is an excellent top-dressing for an orchard. This formula, says the *Scientific Farmer*, "gives some seventy or eighty pounds of potash, fifty to sixty pounds of lime (from the bones), and ten to twenty pounds of nitrogen, and some magnesia in the potash and fertilizer, all of which are called for to nourish orchards on insufficient soil, as the flesh of most fruits contain much potash as well as lime, in combination with the fruity acids, and the seeds phosphoric acid. Sow broadcast and lightly harrow in, leaving it to the rain to more thoroughly incorporate with the earth."—E. H. W., in *Farm and Fireside*.

—There is a much larger percentage of soluble phosphoric acid in good stable manure than is generally supposed. Besides this its chemical action in the soil releases a portion of the phosphoric acid which the soil itself contains and which would not otherwise be available as plant food.

PLOWING MATCH IN ALBEMARLE COUNTY.

Editor Southern Planter:

On the 13th of November, 1883, the Albemarle Plowing Society held its Seventh Annual Plowing Match on the land of Wm. Jeffries, Esq., near Charlottesville.

The contest for the premiums was enlivened by the entry of nineteen plows—eight in the first class of 3-horse plows, and eleven in the second class of 2-horse plows. These plows were drawn by as fine teams as could be found anywhere in the State. Conspicuous among them were the teams of S. W. Ficklin, Esq., of Norman-Percheron mares. The steady and equable motion of these animals fit them pre-eminently for the plow, the action of which should be steady, constant and regular, in order to do the best work.

The ground was a grass ley of five or six years' standing, and the soil was, for the most part, quite a stiff clay. The whole plan having been judiciously arranged and a committee of gentlemen farmers appointed to act as judges, about eleven o'clock the nineteen teams started, at a given signal, with plows of various construction and equipment. The day proved remarkably fine, and the work proceeded with all due order and propriety, without any overstrained exertion on the part of the men or the animals employed. The concourse of spectators was not equal to what we expected, but those who were present went away fully satisfied that it was a day well spent.

The committee having considered and estimated the respective circumstances of comparative excellence in execution, with the value of labor employed, the premiums were adjudged as follows: In Class I, 3-horse plows, prize first to T. F. Coles' man, "Johnson," performing with a Syracuse plow; second prize to "Craven," with Omahun-dras team and a South Bend plow; third prize to Capt. Bryon's man, "Emanuel," with a Rowland Chilled plow. In Class II, 2-horse plows, the first premium was awarded to the Syracuse plow; the second to the South Bend; the third to the Oliver Chilled.

The work of all the plows and of the plowmen was so good that the judges found it a difficult matter to decide between them.

After the plowing the members of the Society dined together at Ambroselli's restaurant, where numerous toasts were drunk, speeches made, and the best humor prevailed.

In accordance with the custom of the Society, the President, after offering some congratulatory remarks, reminded the members that seven years ago, when the plowing match was first started, the plows

used were all of the old Livingston pattern, except two, and that, on this occasion, there were ten or twelve plows of new and improved patterns in use, or on exhibition. This fact alone was an open declaration of the necessity for this Society and for its active support. Improvements continually necessary, because the field of agriculture, although traversed for a thousand years by the wisest and the best of the human race, was still an incomplete art and science. The reason of this is that agriculture is a complex science and a manifold art, embracing all the combined principles of science and art to illuminate its processes. Every year and every day presents something new of value to the farmer; and even, *of the old things*—the practices of ages, there exist in the minds of many the most diverse opinions. Of these *old things*, still undecided, many instances might be adduced, but only one would be considered in direct relation to the work of the day, viz.: Whether plowing deep or shallow is preferable? Speaking for himself, he had no doubt of the greater utility of deep plowing for a large majority of arable lands, as the result of observation and experience; not that it should be understood that he would plow all descriptions of land alike deeply at once, but by an increase of two or three inches every time the land is broken up for the corn crop, until the soil is opened and pulverized to a depth of twelve or fourteen inches. When this is accomplished in any well-drained land, the soil may be likened to a lamp-wick or a sponge, in which porosity and capillary force have the fullest play, and the soil is made a reservoir of food elements to continuously supply the roots of the plant in drought as well as in good seasons.

The beneficial effects of deep plowing are never seen with greater effect than in the cultivation of Indian corn during periods of protracted drought. In such seasons the familiar "twisting" of the leaves of the corn is always regarded as an evidence of the severity of the drought. Even in the better class of lands this "twisting" is most often due to shallow plowing, and he has frequently had the fact directly before his eyes, in which the corn on the deep plowed land remained green and untwisted, while the shallow plowed was twisted and yellow. Few farmers consider the depth to which the roots of agricultural plants penetrate into a deeply-loosened soil. The roots of Indian corn have been known to descend in a congenial soil to the depth of nine feet, and leguminous plants, as clover, peas, &c., to even a greater depth. These may be regarded as extreme cases, but they indicate the importance of enlarging the feeding grounds of the roots as well as doing away with the evil effects of drought. The beneficial effects of

deep plowing are seen in the more perfect drainage, the increased supply of atmospheric air in the soil, increased warmth, accelerated chemical changes in the organic and inorganic or mineral matters, increased area traversed by the roots, an improvement in the mechanical texture, the prevention of grasses "running out," and last, but not least, an increased "*nitrification in the soil*," the promotion of which is one of the most important and money-saving operations the farmer can accomplish. This *nitrification in the soil* is now shown to be due to a microscopic fungus, which only acts under certain favorable conditions. It may be best illustrated by what occurs naturally in British India, where a heavy, rainy and an intensely hot and dry season succeed annually. During the rainy season the deep, porous, alluvial soils, charged with animal and vegetable matters, become saturated with rain-water, charged also with a certain amount of nitrogen compounds, and dissolves the salts and minerals. As soon as the dry season sets in, the water evaporates with great rapidity, and as it rises to the surface soil, it deposits the saline and mineral matters it contains and passes off into the air as vapor. In this way large quantities of nitrate of potash, nitrate of soda, and other nitrates, are left in crystals, and even crusts in the surface soil, from which it is gathered, to be used in the various arts. There are what are known as "*natural nitre beds*," a process which goes on in all thoroughly tilled soils to a greater or less extent. Many other common place facts might be adduced in the advocacy of deep and thorough plowing, but these must suffice.

Another subject of interest is found in comparing the methods of plowing in the past and at present, that oxen are rarely used now to the plow. Is there any good reason for this? Oxen have been in all ages the team preferred for plowing. The steady, slow and heaving motion of the ox team recommends it highly for the plow when we consider the fact that the combined principles of the plow's action are of the screw, the wedge and the lever. In this combined operation no rapid or unsteady motive power can do the work as it ought to be done. It is submitted, therefore, that ox teams shall not hereafter be excluded from our prize lists. As to the difference in the amount of work accomplished in breaking up land between a good 4-ox team and a 3- or 4-horse team, numerous instances might be adduced to show that it is almost an immaterial factor.

After thanks to the judges, the Secretary and President, the Society adjourned to meet next at the call of the President.

JOHN R. PAGE, *President*.

JAMES WEAMOUTH, *Secretary*.

CONCERNING THIN SEEDING.

With the ascertained capacity of wheat to reproduce its kind, it is not at all difficult to believe that much less than even a bushel would be sufficient under favorable circumstances to seed an acre.

A year or two before the war some department at Washington experimented with varieties of Italian and Secilian wheat, and produced from a single grain as many as from 3,000 to 5,000 grains. A gentleman interested in Western agriculture procured, through my agency, a quantity of seed wheat to be imported from Italy by E. L. Palmer & Co., of Baltimore, but unfortunately died before it arrived.

But the most astounding result is related by Dr. Adam Clarke, in his Bible Commentary, apropos of the parable of the sower in which (Matt. 13: 8) the seed sown is said to have produced a hundred-fold. A. M. Miller, of Cambridge, England, on the 2d of June, 1766, sowed some common red wheat. On the 8th of August he took up a single plant and separated it into 18 parts, which he replanted. He repeated the process in the latter part of September, and again about the 1st of April in the following year, making 500 plants. These tillered again, and he threshed $3\frac{3}{4}$ pecks of grain, weighing 47 pounds, 7 ounces, and calculated to contain 576,840 grains.

J. D. M.

Washington, Nov. 2, 1883.

SCIENTIFIC FARMING.

The Rev. Beecher has tried it in all its rigidity. His farm (according to Mark Twain, who never lies), contains thirty-six acres. He does nothing without consulting several ponderous tomes, which are said to cost more than all his tools and stock. He was determined to establish the truth of scientific farming on an immovable foundation; but with all his faith and energies in carrying it out, he found that it had a few drawbacks, which, however, he means possibly to dissipate. As a commercial enterprise he found out that his wheat crop, though standing more than a foot and a half high, brought him sadly in debt, and he forthwith abandoned it. From all the signs he could gather, he was satisfied last year that water melons would be scarce in New Jersey and the South, and he therefore put most of his farm in that crop; but what was his surprise when sending them to market he was told that they were pumpkins! This year he planted a large space with, as he supposed to be, sweet potatoes, but they turned out to be carrots. This, however, he fed his horses on, and was therefore not all a loss. When he bought his farm, to his surprise he found an egg in every hen's nest,

and at once saw the cause of so many farmers coming out the little end of the horn by such wasteful distribution. He therefore gathered them up and put them all in one nest and set a patient old hen on them; but after sitting for eleven weeks a neighbor told him it was no use, they wouldn't hatch, 'cause they were porcelain and were intended as nest eggs. Mr. B. was downright angry at playing this cruel deception on the poor hen. He next—mind, so goes Mr. Twain's statement—determined to change his tactics, and went into the growing of dried apples, and planted \$1,500 worth, but they proved a dead loss, for to his utter amazement not one sprouted! Raising hogs was a specialty with him. He loved the hog for its many gentlemanly qualities, especially as it never did a mite of work, and only ate and drank and slept all the time. Well, he began by buying a pig—quite a youngster—for \$1.50, and after feeding it \$40 worth of corn, sold it for \$9. This was satisfactory, and he means to carry it on more extravagantly next year; for though he lost on the corn, he made \$7.50 on the hog, and it was the only enterprise yielding any profit that he had yet tried.

Mr. B., according to Mr. T., is now looking out for a person to take the farm on shares. Many first-class farmers have applied, but after examining his books and being made acquainted with all the advantages, one and all, to his astonishment, declined, not even regarding the honor of being his partner and conducting the premises under his directions and supervision, to say nothing of the prospective profits, as anything at all!

[This may be intended for a burlesque, but we do not know, for nothing is too extravagant in Dr. Beecher's career. It only teaches a practical fact, that men who undertake farming, or any other business, must know what they are doing. We quote from the *Germantown Telegraph*, Pa., and it is not wholly an untrue story, as many conceited men fail in agriculture as in other pursuits.—ED. S. P.]

A READER'S LETTER.

Editor Southern Planter:

I write to apologize for not sending something for your valuable Journal. I had a communication all arranged and fixed up in presentable style, but on receiving your October number I think, I found that I had been anticipated by Dr. Pollard. His subject, "The Fence, and a good way to work for posterity." His suggestions as to planting cedar posts eight feet apart, to which wires or boards may be attached, are well worthy of a trial. I endorse *every word he says* about the *osage orange*. His head is level on that subject, as it is on everything I have seen from his pen, with perhaps one solitary exception, and that, in one of his communications he makes *my son my father*; but that was a small matter, and I repeat that I endorse all I have seen of his writings.

One of my neighbors intends building a fish pond. What time of the year is best to stock it with young fish? The carp, I suppose, and what steps must he take to procure a supply.

Respectfully your friend,

R. I. H. HATCHETT.

Richmond, Va., Nov. 24, 1883.

[In reply to the enquiry as to fish ponds, we say, that the usual time for stocking is in the *early Fall*, or in the Spring. Fish can be procured by proper application to Col Wm. McDonald, Assistant Fish Commissioner, at Washington city. Pond should be well constructed and fed by a living stream of pure water, and protected from the washings of hillsides, which will make them muddy, and in the course of time fill them up. They may be utilized for ice also, and for this pure and clear water is required. A fish pond, well stocked and cared for, is almost as valuable on a farm as a good hog pen.—ED. S. P.]

THE FERTILITY OF SOIL.

There is great diversity in the fertility of different soils. Some are very productive, others less productive, and still others comparatively barren. After careful investigation, scientific men have come to the conclusion that the fertility of soils depends largely upon their physical and chemical character. In regard to the physical character of the soil it may be remarked, that the degree of fineness of its particles exerts a marked influence over its fertility. In illustration of this Prof. S. W. Johnson, of Yale College, says: "On the surface of a block of granite only a few lichens and mosses can exist; crush the block to a coarse powder and a more abundant vegetation can be supported on it; if it is reduced to a very fine powder and duly watered, cereal grains will grow and perfect fruit on it." There are sandy soils in New England which, without manure, will yield very small crops of buckwheat or rye; and there are many soils in Ohio which, without manure, yield on an average eighty bushels of Indian corn per acre, and have yielded such crops for twenty and fifty years in unbroken succession. Yet these two soils, according to David A. Wells in an article in the *American Journal of Science* for July, 1852, are practically identical in chemical composition, so far as their various elements are concerned. The difference in the two soils is in their fineness. The barren sandy soil of New England consisted in great part of coarse particles, while the Ohio soil consisted of an exceedingly fine powder.

It is found that nearly all, if not all, fertile soils contain a large proportion of fine or impalpable matter. There are many unproductive soils in New England which, if they could be run through a mill and ground exceedingly fine, would become very fertile and produce heavy crops for years without the application of manure. But these soils cannot be run through a mill, that would cost too much. Something, however, can be done to aid in pulverizing them. Air, water and frost

are the potent agents in pulverizing rocks and coarse soil, and their aid should be called into requisition. Frequent stirring of the soil in summer will let in the air, ploughing in the fall will secure the aid of frost, and thorough cultivation will assist in admitting all the rain and promote pulverization. Turning under green crops to ferment and decay will also aid in pulverizing soils.

Why it is that fineness of soil is essential to its fertility is not difficult to understand. The food of plants must be dissolved in water, and the finer the particles of soil are the more ready access the water has to it. Fine sugar thrown into water dissolves much more readily than lumps do. So it is with the soil, the finer the particles the more readily the soluble portions dissolve. When the soil is coarse, only a small portion of the soluble part can be washed, much of it being enclosed in a bed of insoluble particles. When the soil is fine as dust, the water as it permeates through it, is able to dissolve all the plant food that the growing crop needs, and the soil is very productive. Then, again, the finer the soil is the more space the roots of the growing plants have in which to extend and seek their supplies of food. These are some of the reasons why the fineness of the soil contributes to its fertility. In order that a soil may be fertile, its character must be such that it will be favorable to obtaining and retaining sufficient moisture for the support of plants. Soil has the power of withdrawing from the air, vapor, and condensing it in its pores where it is available for the use of plants. Not all kinds of soil possess this power in equal degree. The following table gives in thousandths the quantity of moisture absorbed from the air by different kinds of dried soil, under similar circumstances, in twenty-four hours:

Coarse quartz sand.....	.000
Gypsum.....	.001
Lime sand.....	.003
Plough land.....	.023
Clay soil (60 per cent. of clay).....	.028
Loam.....	.035
Heavy clay soil (80 per cent. of clay).....	.041
Garden mould (7 per cent. of humus).....	.052
Humus.....	.120

It will be seen by this table that humus, which constitutes the bulk of muck and other decayed vegetable matter, possesses to a remarkable degree the power of absorbing moisture from the air. Hence the importance of having a considerable amount of this substance in the soil, in order to enable it to withstand our prolonged droughts. Sandy soils, which it will be observed absorb very little moisture from the air, may be greatly benefited by heavy application of muck, or by ploughing under heavy green crops so as to add large quantities of humus to the land. The capacity of sand, or any kind of soil to absorb moisture is increased in proportion to its fineness. If sand is reduced to a very fine powder, it will hold sufficient moisture for the

purpose of plant growth; but, as it is usually found, it is too coarse to absorb or retain moisture. It is the surfaces of particles which attract and retain water, and the finer the particles the greater the extent of surfaces exposed, the larger the amount of water that would be absorbed and retained. The amount of water which soil can absorb and the slowness with which it allows it to evaporate influence its fertility. A German experimenter, Schubler, prepared tables illustrating the peculiarities of different soils in this respect. The first column of the following table gives the per cent. of water absorbed by completely dry soil, when completely saturated with water, any excess of water having been allowed to drain away; the second column gives the per cent. of water which evaporated during the space of one hour from the saturated soil spread over a given surface:

	Per cent. of water absorbed.	Per cent. of water evaporated in one hour.
Quartz sand.....	25	88
Gypsum.....	27	71
Lime sand.....	29	75
Clay soil (60 per cent. clay)...	40	62
Loam.....	51	45
Plough land.....	52	32
Heavy clay (80 per cent. clay)...	61	34
Garden mould.....	89	24
Humus.....	181	25

It will be observed by this table that the soils which absorbed the least water evaporated the most in a certain space of time. The quartz sand retained only twenty-five per cent. of water when thoroughly drenched with it, and yet in one hour allowed eighty-eight per cent. of the amount held to escape by evaporation. It is obvious that land which contained a large per cent. of sand would need almost daily showers to keep it moist enough for plants to thrive. This want of retentive power for water is one of the chief causes of its unfruitfulness. The only way to render them productive is to irrigate them or add clay or humus to increase their retentiveness. Humus, it will be observed, absorbed 181 per cent. of water and parted with only twenty-five per cent. of that amount during one hour by evaporation. The importance of increasing the amount of humus by adding muck and turning in green crops in soils which suffer severely from droughts, is obvious to all. The subject is commended to the thoughtful attention of farmers generally. Many farms have sand banks adjoining fields of muck, or land rich in vegetable matter. By mixing muck with the sand and spreading sand upon the muck land, both will be made productive. Oftentimes it will be cheaper to mix soils than to depend wholly upon fertilizers to renovate them.—H. R.—*In New England Farmer.*

Don't take too big a chip on a saplin.

KAINIT AND ITS VALUE.

Kainit is extensively used as a fertilizer in Germany, and is coming into quite general use in the East. It is, however, comparatively little known here, and the following in regard to it by Mr. Eli Minch, in one of our Eastern exchanges, will be of interest to the readers of the *Review*:

Kainit is a mineral salt found in Germany at a depth of from 300 to 1,200 feet below the surface and in such abundance as to be practically inexhaustible, being found and mined near Strassfurt; it is also called Strassfurt Salt.

Its great fertilizing power is largely due to the large amount of sulphate of potash it contains as well as other chemical salts. It is imported into this country finely pulverized, and put in sacks of 200 pounds each, and is of very easy application.

I copy from Bulletin No. XXVII of the New Jersey Agricultural Experiment Station, its report of the amount of potash that kainit contains. "Station Analysis, No. 711; Kainit, Alexander Kerr & Bros.; Philadelphia; Potash per 100 pounds of Kainit, 12.80 pounds; cost of potash per pound 03.9c.; cost of Kainit \$10.00 per ton."

I give the analysis of that of Alexander Kerr & Bros., because it is first on the list, and also being superior. A full analysis gives the following composition of 2,000 pounds:

	<i>Pounds.</i>
Sulphate of Potash.....	496
Sulphate of Magnesia.....	286
Chloride of Magnesia.....	252
Chloride of Sodium, } Common Salt, }	640
Moisture.....	288
Insoluble.....	38
Total.....	2,000

It will be seen by the analysis that the quantity of the sulphate of potash is very large, and that of the sulphate and chloride of magnesia also large. The salt, 640 pounds, is also in most cases valuable, leaving only the moisture and insoluble matter, a trifle over 300 pounds, that is valueless. The manurial value of the potash in Kainit can be easily understood by comparing it with ashes. Unleached ashes, as usually sold in moist condition, contain, on an average, of not over five per cent. of potash, or 100 pounds per ton.

Kainit, by the station analysis, contains 12.80 pounds of potash per 100 pounds or 256 pounds per ton. Leached ashes often contain less than thirty pounds per ton of potash. Kainit at \$10 per ton, good wood ashes should, to be equal, be worth \$4 per ton. The value of sulphate and chloride of magnesia, supplying as they do chlorine, sulphuric acid and magnesia, in soils that are deficient in them is some-

times worth the cost of the whole. Kainit is also valuable to mix with compost or for stable use, to absorb bad smells or prevent the escape of free ammonia.

For the above uses it is superior to land plaster, being more soluble, and also from the disposition of the sulphate of magnesia with ammonia, to form a double salt of magnesia and ammonia, fixing all escaping smells and free ammonia.

Kainit, similar to ashes, is caustic, and must not be put in contact with roots of plants, for when applied in so concentrated a form it will burn the plants as quickly as ashes. The best plan to apply Kainit is to sow it broadcast over the land as evenly as possible at the rate of 200 or 300 pounds per acre, as long before the crop is planted as possible, but if that cannot be done, it can be sown after the crop is planted, and will mix with the soil while cultivating the crop. I have used six tons of Kainit on corn, beans, potatoes and buckwheat with the best of results at the rate of 500 pounds per acre. A smaller quantity oftener applied will be better in most cases.

On fruit trees its value cannot be over-estimated, especially on peach trees. I have a small orchard of 300 one-year-old peach trees, that before I used the Kainit were yellow and sickly-looking. The leaves were all curled, and were so hopeless-looking that I was advised to dig them up and burn them. I applied 500 pounds of Kainit broadcast per acre, and as much more in a circle of four feet around the tree, carefully spread, and on the balance I used a peck of fresh wood ashes to each tree.

The change made by the Kainit was complete. No finer growth of wood and leaves can now be found. The trees where I used the ashes, were, after a fair trial, so far behind the others in vigor and health, to save them I used Kainit also, but as yet they are behind them in growth.—*Farmer's Review*.

SALT AS INSECTICIDE AND FERTILIZER.—Colonel Piollot, at the Elmyra Farmers' Club, said he had used salt on alluvial and diluvial soils with good effect. Last year he had fifteen acres of corn treated to eight bushels of salt to the acre, after planting the corn. There were no cut-worms on that field. His brother had no faith in salt as a cut-worm antidote, and used no salt, but had to plant his corn over, after the cut-worms had fattened on his first planting.

He claims to have destroyed the black fly completely by the use of salt in the cultivation of turnips.

On strips of wheat land where salt was sown no Hessian fly appeared, but on strips where no salt was sown Hessian fly cut down the yield from five to eight bushels per acre. He also claims to have derived essential benefit last year from sowing salt on his potato crop. He advises farmers to combine and buy salt in bulk by the car-load.

'Tis a strange truth that only in the agony of parting do we look into the depths of love.

PUBLIC ROADS.

Mr. Editor,—I was interested in the remarks of Mr. Normand Smith, of Henrico county, on "Public Roads," in the *Planter* for December, 1883, and agree with him in most that he says.

There are no improvements which should interest farmers more than that of the public roads and the methods to keep them in proper repair.

There can be no one rule or method for repairing roads that would be practical for every locality to adopt, as the condition and circumstances are not the same in every district or State; but the drainage law of Michigan is what every State should adopt for sanitary purposes, if for no other.

The road law in Virginia that allows the surveyor no compensation for his services, except for summoning hands, is unnatural, and only a relic of the dark ages, to be classed with the Blue Laws of Connecticut. It defeats itself, for where there is no compensation there can be no responsibility. This law also required the surveyor to make his annual report early in March, which is at least a month earlier than is practical in most seasons. The greater portion of the roads in Chesterfield county cannot be worked to advantage except when the frost is just out of the ground, which in this locality is usually in February.

Within a year or so the law has been changed; what is required now I only know from the manner of working the roads since under the special direction of the Board of Supervisors. One man is employed with team and tools to work all the roads and warn out the inhabitants as he passes along from one road to another. This method is deficient in many ways; having so much territory to work, he cannot work all at the time it can be done to advantage; he cannot be present to repair wash-outs and bridges in the time of it. After the ground has thoroughly settled from frost, the greater portion of our roads cannot be greatly improved, except by throwing out stones and clearing off bushes, and the worse feature of all is, at this season of the year farmers and laborers are so busy with their crops they cannot leave them without a very great sacrifice. The man employed may be ever so competent, but the circumstances are against him and beyond his control.

All things considered, the old system is preferable, with a few exceptions. The surveyor should be allowed reasonable pay for his services. Most farm laborers are colored and non-property owners, but equally benefited, and should be taxed to work *one day*. Property owners should be assessed for the rest *pro rata*, according to their valuation. The colored people are so lax in their economy of time that one day is

"no count" to them, and really would consider it a dishonor not to have their part and lot in the work.

There should be an honorable strife or pride among farmers in every district to see which should have the *best roads*. Besides being of immense value to the travelling public, it quite as much increases the value of each farm; hence, while working out the tax you are really working in your own interests, and the labor should be as cheerfully and faithfully performed. With all this in view, each district would choose their best men for surveyors, and could do the work when most needed and at the time when it would be the least burdensome.

Roads should be well rounded in the middle, thoroughly drained, no stones allowed within reach of the wheels, and no wider than can be thoroughly worked. All bridges should be made of thoroughly cemented stone or tile, where it is practicable, as a matter of economy.

Centralia, Chesterfield Co., Va.

E. BONNEY.

PHOSPHATE vs. SUPERPHOSPHATE.

"Superphosphate" is now a household word with our farmers. Since the day when Liebig suggested the employment of sulphuric acid to render the more valuable phosphoric acid soluble, hundreds of thousands of tons of superphosphate of lime have been used. The almost universal need of phosphoric acid in our soils warrants the attempt to cheapen the supply, and to inquire whether in some cases a simple phosphate may not be as efficacious as the manipulated and more costly article.

In 1870 I sent a ton of common, ground, but otherwise untreated, South Carolina phosphate to my brother, then residing on my farm in Louisa Co., Va. He applied it at the rate of 300 pounds per acre to corn in the hill. The Summer was very dry, and the crop was a failure. In '71 the field was sown with oats and seeded with clover; another dry year and another failure of the crop followed. But in '72, wherever a hill of corn had stood, there, and there only, was a bunch of clover. Satisfied I was on the right track, I applied the raw phosphate to wheat on a more extensive scale. A field of fifty acres was sown to wheat and manured with this cheap fertilizer, in quantities varying from 250 to 400 pounds per acre. A strip about an eighth of a mile long was manured with a good unammoniated superphosphate, and another strip equally long was left unmanured. The fertilizer and wheat were sown broadcast and harrowed in together. At harvest and during the growing season no difference could be perceived between the effects of the superphosphate and raw phosphate, but the unfertilized strip bore a very poor crop. A mile off it could be seen like a road running through the field; on either side was a fair crop, considering the extremely poor

soil, and on the strip itself, a stunted growth that did not cover the ground. The field was then left to itself, when, except on the unfertilized strip, a spontaneous growth of Red Clover appeared, affording fair pasture. The clover gradually died out, other grasses, Blue or Wire Grass—*Poa compressa*—especially, taking its place, but the strip remained visible for years.

Then in conjunction with my brother, I tried it in corn, both on his farm and on mine, with marked benefit, but so far no quantitative test had been made. In 1880 I procured Professor Atwater's set A of fertilizers for an acre and in addition manured a plot with raw phosphate at the rate of 400 pounds per acre. The whole was planted with corn. The phosphate gave an increase of 19 bushels of shelled corn per acre over the unmanured plot, beating 300 pounds of superphosphate, alone and with potash, but being beaten by the complete manure, viz., superphosphate, potash, and nitrogen. It even beat stable manure at the rate of twenty loads to the acre, but this I think was due to the latter remaining undecomposed in the soil. An account of this experiment can be found in the Conn. Ag. Report for 1880.

A great advantage in the use of this cheap fertilizer is that there is no waste. It neither leaches, evaporates, nor "reverts" from a dear fertilizer to a cheap one, but remains in the soil for an indefinite time ready for use. In 1881 the experimental corn-field was sown with the common black Southern field pea; no additional fertilizers were sown, and the comparative results were about the same as with corn, except that the stable manure was ahead. In the Fall, Winter oats were sown, that were harvested in '82. The raw phosphate was equal to the superphosphate in this test, and far ahead in the clover that followed the oats. The cost of hauling and spreading the stable manure was equal to the whole cost of the phosphate, and yet it is hard to say which of these two manures has given the largest crop of clover. To the eye they are equal.

Here are four crops in succession, all benefited by the single application of the plain phosphate. The corn and the clover especially prove themselves abundantly able to dissolve it, and that, for them, the costly soluble phosphoric acid is unnecessary.

Enough has been said to warrant farmers in testing the so-called insoluble phosphate; a single bag will be ample. Try it against a good plain superphosphate; weigh the crop and report results. Unfortunately, chemistry does not determine which form of phosphoric acid will be the best; a soil test is the only reliable guide. My soil is a decomposed gneiss, containing but little lime. On limestone soils a superphosphate may prove the best, for it is thought that to be efficacious, phosphoric acid must be insoluble, and in a limestone soil the acid is speedily precipitated as an insoluble phosphate of lime *in an exceedingly fine state of division*, and here lies the secret of the efficacy of a superphosphate. It forms a precipitate far finer than can be made by mechanical means. In soils devoid of lime the soluble phosphoric acid may either remain soluble, and be positively injurious, or it may combine with alum and alumina, making the very insoluble phosphates of

those substances. By applying a raw, undecomposed phosphate these evils are avoided.

Finely powdered South Carolina phosphate can be obtained in the large cities. It is advertised in Baltimore and New York. [Yes, and also in the *Rural*.—Eds.] In the latter place it is offered for \$17 per ton, containing 55 per cent. of bone phosphate. I confidently look forward to its extensive employment, and hope that those who use it will make the results public—the failures as well as the successes.—GEORGE CLENDON, JR., in *Rural New Yorker*.

THE PEANUT.

An Important Crop—Where it is Grown, How it is Cultivated, Harvested and Prepared for Market—Its Value, &c.

[We received, some weeks ago, a request from a reader of the *Planter* in North Carolina, that we would publish something in reference to the culture of peanuts, their profit, &c. We take the following exhaustive article from the *Industrial South*.]

Perhaps few articles of commerce ever grew suddenly from the diminutive proportions of a pet crop, grown in patches, to the mammoth supply of a great staple. Yet such is approximately the fact in regard to the peanut or "goober."

A few years before the war this esculent nut was cultivated rather for fun, as an experiment, and to eke out the gifts of Santa Claus to good children, than because of a general demand or the hope of profit. Then the cultivation was almost exclusively with the hoe, and the tedious operation of putting a hoe full of dirt and patting it down upon each vine was believed to be a necessary feature in peanut farming. Now, in five counties of Virginia, Isle of Wight, Southampton, Sussex, Surry and Nansemond, this crop is planted by hundreds of acres, in some localities rivalling and defeating the highly valued staple, cotton, for popular favor.

The Virginia peanut is more highly valued than its North Carolina contemporary, because of its size and weight, while its bright, clear color makes it more desirable than its Tennessee namesake. Close observation and a thorough practical knowledge in the matter have convinced the best farmers in the counties referred to that lime is absolutely necessary to the production of a full, plump, white peanut. Where it already exists as a component element of the land, the application of kiln lime should of course be less, but the peanut insists upon the presence of lime in the land as necessary to its full and healthy development.

In the sections where this crop is most productive, the average application of shell lime is about 1,000 lbs. per acre, varying of course in quantity according as the crops have been rotated. The mode of applying the lime varies somewhat according to individual experience, the pressure of time and other immediate and surrounding causes.

But when time and means are abundant, the provident farmer hauls up his mud from the circum-adjacent swamp in the Fall, and relies upon the cold of winter, and a liberal application of lime, to correct its acidity and otherwise prepare it for the crop.

In lands where there is necessary delay in obtaining the lime, it is then applied as a top dressing, and with usual good effect if the plant has time to absorb and assimilate it.

The usual manipulated guanos are also extensively used in the production of this nut, with varying results according to the intrinsic value of the guano, its adaptability to the land, the quantity used, &c.

The usual quantity is about 200 lbs. per acre, and when the note falls due at the rate of about \$45 or \$50 per ton, with a short crop and dull market, the cuss-words of the old farmer have at least the merit of being emphatic and candid, though they may lack elegance.

While much has been written and said about the manner of cultivating the peanut, there is really little to be said about it as a special method, save to work the fields often enough to keep them clean.

The rows are laid off 3 feet, 3 feet 6 inches, or 3 feet 9 inches apart, according as the land is productive or not—the vine on strong land requiring of course more room—the guano or compost is then deposited in the drill, and the lists are then thrown up to complete the row. The land is of course supposed to be free from clods, well pulverized and well drained.

Next comes what is locally and technically called a “dotter.”

This implement is simply a frame containing a roller into which pins have been inserted so as to “dot” or make holes upon the row about 18 inches apart, the roller being preceded by a “shoe” or scraper for the purpose of levelling the row.

Laborers follow the “dotter,” dropping one or two nuts, just as seed happens to be plentiful and the weather favorable, in each hole, covering and pressing the dirt upon the nut with the foot.

The planting is usually begun upon light uplands about the 1st of May, upon damp low-lands latter, according to the spring rains. The sooner, reasonably, the planting is done the better, because it gives you a better opportunity of testing the procreative power of your soil, and more time is thus given you to re-plant, though the writer has made good peanuts by replanting as late as the 18th of June.

When planting is begun earlier than May 1st, the nut is planted unshelled as being then better protected from the cold damp spells which sometimes come in April and early in May, though the usual method is to shell them, as the nut then responds more readily to the action of the heat.

The planting should be done, if possible, when the ground is moist, but not too wet. The peanut is extremely sensitive to cold and wet, and soon rots when exposed to the combined action of these agents. It will lie in the ground for many weeks waiting for a rain, if it be only deep enough to prevent it from being baked by the sun.

After the plant gets up it requires a great deal of moisture, and

plaster should then be liberally applied, so as to assist the plant in getting moisture from the air, if the ground should be too dry.

Lee's Prepared Agricultural Lime has been used with very fine effect by the writer, putting 300 lbs. per acre.

After the plant is well up, replanting should be begun, at the same time trimming or scraping the row and weeding out the young grass with the hoe.

The cultivation should then proceed regularly and frequently, alternately throwing the dirt to and taking it away from the plant, accompanying each plowing with hoework till prevented by extension of the lateral branches of the vine, and then finger-work should be substituted, 'till the crop is "laid by," usually from the 1st to the 10th of August.

The ends of the vines should be broken up at each plowing, as the limbs are then prevented from throwing out needles and thus wasting the vigor of the vines in abortive attempts to make nuts at the ends of these tentacles. The vigor of the vine should be expended in making and developing well grown nuts around the stem of the plant.

In saving seed, they should be dug before frost withers the vine too much; should be thoroughly dried before stocking; should be carefully picked and put away in open bulk, so as not to be damaged by heating or severe cold. Many farmers lost their seed last winter from the severe cold, only the nuts in the centre of the bulk being saved.

Digging begins about October 10th, according to the weather. After being plowed up the vine should be turned so as to expose the nut to at least one day's good sun, then shocked, taking care to allow room between the shocks for pure circulation of air.

The shocks should be carefully put up, taking care to lock each vine around the stick, making the shock a little higher than a man and in bulk larger than a barrel.

They should remain in shock about two weeks, and when taken down should be immediately picked off.

Many years ago, before the invention and introduction of "Cleaners," the farmer was expected to clean his crop so as to insure the sale, but for two seasons the crop has been sold in the dirt, the buyer preparing and grading the nut for market.

The merchants of Norfolk, the principal peanut market of the world, in 1879 decided that the crop should be bought and sold only by the pound, but prior to that time it was sold by the bushel—22 pounds of the Virginia pea making a bushel, 28 pounds of the Tennessee pea to the bushel, and 32, I think of the North Carolina pea to the bushel.

For many years subsequent to the war this commodity brought almost fabulous prices, the "gilt-edge" in some instances bringing \$4 or \$4.25 per bushel.

The prices realized last season were 3, 3 $\frac{1}{4}$, 3 $\frac{1}{2}$ and 3 $\frac{3}{4}$ c. per lb., making a considerable fall off in the price.

The latter price, while much less, is a more healthy and reliable one, and with an average yield of 50 bushels to an acre, there is really more money in the crop than in cotton.

The peanut is dependent upon fewer contingencies of weather after

it comes up, but it is a subject of much more frequent depredation than its rival, because everything in the world, from an ant to an elephant, from the negro who plants and picks them off, to the commission merchant who sells for you, considers it a legitimate prey and eats it without scruple.

The "hands" charge 10, 12½ and sometimes as much as 15c. per bushel for picking off, ostensibly boarding themselves, but really boarding themselves on the nut; while in planting, the seed has to be covered with coal tar to protect it from the fox, mole, dog, and the chap who drops it.

A few persons have attempted to introduce a machine for picking off the nut, but only with medium success, as the machine breaks the hull and mixes in fragments of the vine, thus making the crop more difficult to clean.

The hand-picked pea is much more sought for, and commands a better price.

Among the collateral or auxiliary industries introduced by peanut culture, none has proven more profitable than the manufacture of shell lime from the oyster shell, which has been hitherto so little utilized for that purpose. Many villages in the Southside tidewater counties now have their kilns, and lime can be readily had at \$5 or \$5.50 per ton. Suffolk has two such kilns, and by reason of its accessibility has grown into quite a market for this article.

The genius of invention has also received an impulse from it, and every season witnesses the introduction of some new picker and cleaner.

So far, none have given entire satisfaction, but possibly constant experimenting may develop a machine equal to the slow but better plan of hand-picking.

So from the little basket of the proverbial cake-woman who used to visit Virginia musters, courts and elections, we find the peanut crop has expanded 'till ships and long trains groan under their weight.

The crop has, besides its commercial value, its characteristics and peculiar features, for when several families of negroes gather their shocks around the same fire, and make twenty or more groups, the field has a picturesque and interesting appearance, while the happy laugh, the camp-meeting hymn, or the latest scandal, helps to while away the time and sweeten their labor.

Peanut-picking is rapidly supplanting our old time corn shuckings, and helps to revive and retain much of the conviviality of those occasions.

The vines of the crop, at one time much used as forage, are now generally restored to the land, and the crop is not now considered much more exhaustive than cotton. When tenants cultivate the land, they usually pay one-fourth of the crop, leaving the vines on the land, they being at all the expense of planting, cultivating and saving the crop, the lime and guanos being jointly paid for by the tenant and land-owner in the same rate as the crop is divided.

"PEACH CULTURE" AND BORER.

The above caption in your December No., calls for a few remarks. I have raised peaches for my family use for over a half century with success, and will therefore speak with some authority. Your correspondent "M.," has, I think, several errors in his culture. In the first place the peach is a tropical fruit, and its roots especially should not be exposed to frosts. My father, in early times, before the peach-borer made its appearance, had great success with peaches; but his trees were finally killed when the borer made its way westward. Supposing that long cultivation of the soil caused the death of the tree, he cleared a new field and replanted his orchard. In the mean time he was told of the ravages of the borer, and the remedy of taking away the earth from the roots to kill the borer was tried. But the trees and borer were both killed! My practice is to clear away the soil around the peach stock to the roots in early spring before the fly lays the eggs. The bark is then examined with care, and where the gum exudes it is cut away with a narrow, stiff knife-blade, and the worms taken out and killed. The tree is then whitewashed with strong lime for a few feet above the ground, and then hilled up from eight to ten inches, and so left till fall when the leaves begin to drop off, when the earth is removed and the worms again killed. The object of the hilling is to place the maggot of the borer above the roots, where they are easily cut out with the knife, when the trees are again whitewashed, and the ground left level till freezing sets in, when they are again hilled up and left so till early spring, when the same process is continued. The peach thus treated will last from fifteen to twenty years and bear well.

"Cutting back" the boughs of the peach tree, denounced by "M.," is recommended by all peach growers and is always practiced by me. As soon as the tree is planted out, or appears in the nursery the second year, it should be trimmed closely in early spring of every limb, and the top cut off somewhat, when new limbs put out all along the stem and grow for one year. The second year after the setting in the orchard the tree should again be trimmed as high as the bowl is desired to remain. I prefer low trunks. From this time the limbs should be headed in ("cut back") till they assume a regular sugar-loaf or oval form. and so cut back say generally one-third of each year's growth, till the tree has borne a few crops of fruit; when all trimming should cease, being no longer needed. The reasons for this plan are these: The trunk is made low against sun and winter frosts protected by the

branches; the limbs do not fork nor split, nor do they bend down and decay in consequence; the tree is strong and stocky, and by cutting back last year's growth you also trim away much of the bearing wood, and thus thin the fruit, which is nearly always required for its full growth and flavor; and the fruit is so low as to avoid wind-falls and to be easily gathered; and by this process no large limbs are ever cut away, as all such surgery is injurious to the health of the tree.

I think "M." is in error also in advising stimulating in the nursery and leaving it off in the orchard. Sudden change of food for animals or plants is always injurious, hence the trees highly stimulated in the nursery are often lost or stunted in the orchard. Equal treatment always is best.

"*The Yellows.*"—I have long been of the opinion that there is no such cause of death to peach trees as "the yellows." When the borer weakens the tree by girdling the underground bark, "the yellows" ensue. It may be possible that animalculæ or fungi are present on the leaves in such cases, as nature always asserts by such means the dissolution of organic matter; but these are the consequences, not the causes. So of the "Pear blight" the same may be said. And many of these microscopic bacteria and other reported infusoria are nothing but the ultimate globules of animal and vegetable structure in normal motion!

C. M. CLAY.

White Hall, Ky., 1883.

THE EAST VIRGINIA MARL BEDS.

We make the prediction and enter it here upon record, that from the marl beds of Eastern Virginia and the limestone of the Valley will come the future supply of commercial fertilizers for this state and section. From the day of the introduction of Peruvian guano to this time, farmers have had the round of a long list of manipulated fertilizers, and they have been thoroughly tested and found to be costly, in many cases too costly, and now attention is being diverted to chemicals as the thing for the farmer. He is told to bring a few hundred pounds of chemicals, and to make his own manures. Well, this has been tried and found to be no better than the other. And so it will go on till farmers take more pains to educate themselves, and find wherein they have been the loser throughout the whole period of commercial manures. The manufacturers will continue to find some nostrum to dispose of at good figures to the unwary.

But the light of a better knowledge is gradually getting abroad, and it will not be very long before the Virginia farmer of the Valley or of the Seaboard will know of a certainty, that he has a better material for a fertilizer right in his neighborhood and upon his own farm

than any he has been getting from abroad. A calcareous soil is not only the best possible one for peanuts, that great and growing staple of the East, but it is the best for all kinds of grain, and for nearly everything that the Virginia farmer produces. And of all calcareous manures yet discovered, the Virginia marl seems to possess qualities superior to any. It is not only the large amount of carbonate of lime that most samples of this marl contains, that makes it so efficient and valuable, but it seems to possess the power of assimilating with the mineral and vegetable matter already in the land where applied, and of farming with it our homogenous mass of fertility for feeding and nourishing crops to a higher degree than any other known material. For farming a complete soil in conjunction with vegetable matter, it is better than lime, better even than ashes, and far ahead of plaster.

Its great value, no doubt, lies in the amount of carbonate of lime that it usually contains, and this alone, to say nothing of other elements known or unknown, will always make it an article of high value as a fertilizer. Think of almost inexhaustible beds throughout all Eastern Virginia, all containing from thirty to sixty or seventy per cent. of the valuable carbonate of lime, and these but a few feet beneath the surface, and laid along almost every stream and valley, even to the very barn door of many farms, intersecting the fields, and cropping out in the hillsides in every direction, and you will have some idea of the immense deposits of this material awaiting the wagon and shovel of the farmer to take it away and make it useful. And along the James, York, Rappahannock, and other large tributaries and estuaries of the Chesapeake, it is even more accessible still, jutting out in the banks high and dry, requiring only to back up the carts and throw it in without so much as a drop of water to incommode the labourer. To put it in a short, expressive phrase: there are millions of it; not only millions of tons, but millions of car loads.

And when its value is better understood and appreciated, and when our railroads shall so reduce freights as to render its transportation to distant points reasonable, the farmer of the Piedmont and of the plains will begin its use, and the Seaboard farmer will give it in exchange for wheat, or cattle, or wool. Put the price of transportation low, and there is no reason why almost every western bound freight train of the N. & W., and of the A. & D., when built, shall not carry one or more car loads of marl above tidewater, to the plains and to the Piedmont. Then we shall see piles of it at every railroad station, and every farmer will use marl and sow peas to improve his land, and commercial nostrums will be employed in smaller doses and with greater caution. At five dollars a ton it would be the cheapest fertilizer in the world, and the trade in it would become immense. No fears need be entertained that the supply would soon fail. A century would not remove the ninth part of it.

And if this may not be—even should a car load of it never be sent away, still one-third of the State has it in bed. Let the farmers of this section utilize it as they should, and great will be the gain. It is the one great fertilizer for the peanut, and of this alone it will continue to pay.—*Index-Appeal*.

WATERING WINDOW-PLANTS.

There is nothing that seems to bother more those who would grow window-flowers, than how often to water them. It is an exceedingly simple thing to those who have had experience, though so mysterious a thing to those who have had none. When the skilled gardener is asked for advice, he says, "Water only when the plant needs it." But this tells the inquirer nothing. There still remains to be understood how to tell when plants need water. After all this is a species of knowledge that cannot well be taught by another. It has to be learned from experience. The good plant-cultivator tells from the color of the earth; but even this is a relative term. There is dark soil and there is light soil; but all soils are darker when they are wet than when dry. One can soon learn this by experimenting a little; and can soon tell whether the earth is dry or wet, by the eye or finger alone. If it is wet, it of course wants no more water; if much lighter than its usual color, the earth is dry and needs some. It is an exceedingly simple matter to those who will try to learn; to those who cannot learn themselves it is a hopeless task.

There is one hint that we may give that may be of value. If the earth never gets dry, the plants are not in good condition. Something is wrong. It is the active, growing, working roots that take the moisture out of the earth. It is a sign of good health for the plant to want frequent watering. As we have already said, the color of the soil, as compared to what it is when wet, will tell whether it wants water or not.—*Germantown Telegraph*.

NEWSPAPER LAWS.

Read them carefully, and avoid any misunderstanding:

1. Subscribers who do not give express notice to the contrary, are considered wishing to continue their subscription.
2. If subscribers order the discontinuance of their periodicals, the publishers may continue to send them until all arrears are paid.
3. If subscribers neglect or refuse to take their periodicals from the office to which they are directed, they are held responsible until they have settled their bills, and order them discontinued.
4. If subscribers move to other places without informing publishers and the papers sent to former direction, they are held responsible.
5. The courts have decided that refusing to take a newspaper from the office or removing and leaving them uncalled for, is *prima facie* evidence of intentional fraud.
6. Any person receiving a newspaper and making use of it, whether he ordered it not, is held to be a subscriber.
7. If subscribers pay in advance, they are bound to give notice to publishers, at the end of their time if they do not wish to continue the paper; otherwise the publisher is authorized to send it on, and then subscribers will be responsible until an express notice, with payment of all arrears, is sent to the publisher.

THE FRUIT TRADE IN HENRY AND PATRICK COUNTIES.

Since the war a great many orchards of apples and other fruits of improved variety have been planted, and now they are beginning to return to their owner's handsome profits.

The blackberry trade has yielded large income, and as they are saved by the women and children who would not otherwise be profitably employed, this much might be considered as clear gain to the community. Then the desired apples are of next importance. A great quantity of apples have been sold recently to the merchants of this place, and for high prices, beside what has been sold directly to drummers from wholesale fruit dealers in the cities. Dried peaches have had a great run, and prices have been higher than for many years. We have heard of instances in which one single family has saved and sold several hundred dollars worth of fruit.

In Patrick, we have heard that a considerable quantity of raspberries has been brought on the market, and they sell higher than any other fruit.

The raspberry might easily be cultivated and made very profitable. The blackberry will grow spontaneously, but it might be improved by cultivation. Most all of the exhausted land in this country will produce the blackberry. If planted in rows, the fruit can be much easier gathered, and it would prevent the washes and at the same time improve the soil. As most of the apple orchards have been planted since the war, the fruit business may be said to be in its infancy, as compared with what it will be a year or so hence.—*Martinsville Herald*.

JUDICIOUS FARMING—WHAT IS IT?

Some years ago we heard a farmer who had become rich at the business, remark, in a conversation on what might be called good or judicious farming, that the "test of good farming is that every successive crop is better than the one that preceded it." To obtain such an evidence of skillful tillage, however, for a large series of years, would of course be an impossibility, but to keep the soil in such a state of fertility as to insure a full and remunerative yield when favored by the season, is an evidence of intelligent farming of by no means uncommon occurrence. We have no fear of the ultimate prosperity of the agriculturist who secures this encouraging result of his labors. We have seen extensive and highly-cultivated farms by subsequent injudicious cultivation degenerate into barrenness; and we have not many miles to go to see the once sterile and sand-plains of Jersey, by systematic tillage, liberally rewarding the proper labors of the husbandman. Land there that was formerly covered with rank grass, huckleberry bushes and stunted pine trees, now yield in an abundance the choicest varieties of grapes, pears, cherries and apples, and all the field crops that can be profitably grown in the adjacent states. Good tillage, having developed the true character of this once comparatively unpro-

ductive soil, has in many localities enhanced its pecuniary value, and there are plenty of instances where a quarter of a century ago land that could not be sold for five dollars an acre, would not now be disposed of for a hundred dollars an acre. Thus, as the value of the soil of New Jersey for agricultural purposes becomes disclosed the quantity and worth of her grain, fruit and vegetable products steadily increases, and will continue to do so.

And all this is the result of what we simply call *judicious farming*, and it answers the question which is asked at the start.—*Germantown (Pa) Telegraph*.

THE OPOSSUM.

Mr. Editor,—In your journal of this volume, No. 3, you have an article entitled "The Kangaroo and Opossum." Not long since I saw an article in a very respectable newspaper, where a "clergyman" asserted that the carrier-pigeon flew one wing while resting the other! when every farm-child of an age fit to enter school, knows that so far from resting the whole wing, a few inches cut off from its tip would cause any bird or fowl to be disabled from flying at all. Now, we find in so brainy a paper as the *Scientific American*, the assertion of this correspondent, "H. D. G.," that the young of those marsupials "grow out of the teat of the mother's pouch." Now, everybody does know that the young of all the mammals grow from the ovum generated in the womb, and is nourished by the blood of the mother's system, and not by the milk system till after birth. Can any absurdity then be more wonderful than R. D. G.'s experience of seeing the young opossums growing, like a knot on a tree, upon the teat and milk of the mother! Hume's reasoning upon miracles would be beneath contempt, if such stuff as this needs refutation. But it seems that it does. Well, let us see; the opossum's pouch is a loose extension of the skin of the belly on both sides, from fore to hind legs, covered with hair like the rest of the body, with two parallel rows of teats like the sow has. When the pig is born, by instinct it never stops a moment, but passes at once around to the teats of the mother, and then lays hold and begins to suck, and so each pig of a dozen, if there are so many, will do the same with the regularity of clockwork. Now, when the opossums are born, by the same instinct the little ones take hold of the teats, I will not say unaided by the mother, as I have no proof, never having been at a birth. But I must tell R. D. G., that old Kentucky is a possum-raising State, and for a long life I have been familiar with the opossum and its habits. The reason for this unusual provision of Nature in this animal seems to be like the provision for birds, by the embryo being continued in the voided egg till by the heat and moisture of the mother's breast it is able to assume its independent existence. If the birds were viviparous the eggs would weigh them down and prevent their flying, and subject them to destruction by their many enemies. For even the bones in birds are made porous, hollow and marrowless, to make the

whole machinery lighter, so they may fly with their air. Now, the opossum has a great many young at a birth, and Nature relieves the mother simply by hastening the time of birth and maturing the embryo for separation from the blood circulation even before the hair is of much growth, and substituting the hair of the mother's pouch instead to cover the young until their own is sufficient. The hair on the opossum is mixed with fur, and the whole coat is very thick, which would be another reason for speedy birth. And of all our animals the opossum is the most lethargic, moving over the ground with great difficulty and apparent pain as the sloth. The opossum is very peculiar in its habitat, moving but very short distances on account of its awkward structure. It therefore takes its house in a rock or hollow tree near the pawpaw bushes, grape-vines, oaks and other food, where they exist in profuse quantities. Its principle food is composed of berries on trees and bushes, and its tail being prehensile like the monkey's, serves it a good purpose in getting from limb to limb. The little "possums" would therefore make but poor taking care of themselves if the mother did not a long time bear their burthens.

These animals have but very little muscle, but take on fat profusely and are very much like a roast-pig in very rich flavor. They, like the bears, hybernate; they lie in their holes during the cold weather, and live upon the absorption of accumulated oils or fat. In early days, when the winters were more equable in consequence of the protection of forests, the snow lay much longer on the ground; and when the winters were long or for some other reason, the opossums would venture out and seemed to be hunting acorns or hickory-nuts, by turning up the dead leaves. The bears will also at times leave prematurely their winter-quarters and go in search of food. The opossum, I think, lives much upon snails, bugs, frogs and other kinds of animals. They are very fond of chickens, and were in early times much in the habit of robbing the hen-roosts. But as their food has been restricted by civilization, and as their flesh is very much liked, they in this region, once so plenty, are now rarely seen, being found mostly in the inaccessible cliffs of the Kentucky River, where neither man nor the red foxes, which are believed to eat them, can penetrate.

But I wander from the caption, and conclude that all the pouches I have seen at many stages of the growth of the young opossums have extended the whole length of the rows of teats, the young being covered by the falling walls of the skin as between two blankets. And R. G. D., must have a large little finger if it could not enter such a pouch! although its power of contraction is considerable.

C. M. CLAY in *Germantown Telegraph*.

White Hall, Ky., 1883.

No one can exist in society without some specialty. Eighty years ago it was only necessary to be well dressed and amiable; to-day a man of this kind would be too much like the waiters in the public dining-rooms.

POA PRATENSIS OR KENTUCKY BLUE GRASS.

Editor Transcript,—In the dearth of political questions of interest, I find much pleasure in agricultural pursuits and inquiry. It is a matter of very small importance whether the Kentucky Blue Grass is indigenous or not; but having asserted that it is not, I think I can maintain my position. Some years ago I sent a whole plant of this grass to a learned scientist of the East, who reported that the blue grass was identical in all respects with the *Poa Pratensis*, or English "Green Sward." Now the English "Green Sward" has existed long centuries in England; long before Kentucky was known to civilization. If it was indigenous native in England, it cannot at the same time be native in Kentucky; unless we reject the Mosaic account and admit that it originated in England and here both. I presume that no one will contend that it found its way from here to England long centuries ago. There is no doubt, that grasses and other plants are carried in the seed by birds and other animals, which make long migrations, and hence I found the *Poa P.*, on the Northern lakes, near St. Paul, in Minnesota, and at St. Petersburg, Russia in latitude 60 degrees north. Wherever it originated, therefore, the *P. P.* has taken a wide spread over the earth. I was the first to make the culture of Blue Grass a specialty in Madison county, and I know that notwithstanding it had existed for half a century on my lands, it had to be sowed in the newly cleared fields. The seed were no doubt brought from over the sea purposely to set lawns in the East of America, which was a comparatively old country before the settlement of Kentucky. It was no doubt brought to Kentucky by immigrants; or it may have been brought by animals. Certain it is that it did not rapidly spread, as it would have done, if nature had sown it over this State. It was first sown in my father's yard, and then took hold on the woodland, clearings and fields. It went from here by seed purposely transplanted into Ohio, Illinois, and the Western States. As the Blue Grass, like Napoleon, was moving whilst its enemies were quiet, growing in early spring and winter, whilst other grasses were dormant, and by its tenacious hold, stifling all other grasses, had it been indigenous no doubt it would have taken all the prairie lands of this continent long centuries ago, at least wherever the soil and climate enable it now to hold the mastery. I think these facts are incontrovertible, and that the reasoning is logical when I repeat that the Kentucky Blue Grass is exotic, and like the honey bee, follows civilization westward.

C. M. CLAY.

White Hall, May, 1882.

The important point in threshing grain is to have sufficient help to keep a steady flow of grain to the separator; Too rapid threshing is wasteful, and an unskillful thresher can easily lose more than the cost of clean work by letting grain go into the stack.

Editorial.

SMUT IN WHEAT.

We have a letter from a correspondent who communicated to the *Planter* several years ago his experience as to the best method of preventing *smut* in wheat. He refers to a recent article of ours recommending the *wash* and *soak* for twelve hours in strong brine. He does not say that our plan will not accomplish its object, but thinks his plan of frequent washings in clear water is a better one. We agree that smut in the *new* grain is produced by the fungus spores which adhere to the seed which is sown. Any method by which the spores can be removed and the seed made perfectly clean is a safe remedy against the appearance of smut in the next crop. It so happens that our correspondent and ourself were for many years near neighbors, and each was familiar with the practice and views of the other. Our plan for freeing the seed wheat from the obnoxious germs we regard best, for the reason that it is simple and involves but little labor or cost. Salt is an inexpensive article, and the cost per bushel of wheat is a mere trifle. Besides its purifying properties, it is a valuable manurial agent in the early growth of the wheat. The plan for salt-washing is simply this: Have a watertight tank, or a set of tubs, sufficient to hold as much wheat as will be sown in one day. Fill this tank, or the tubs, half full of clear water, and then add as much salt as will make a *strong brine*. Pour the wheat into the brine gently, or slowly, so that the grains will become separated as they touch the water. The light and inferior grains will for a few moments float on the surface, when they should at once be skimmed off and rejected. The heavy and sound grains will sink to the bottom; and then a man should roll up his sleeves, extend his hands to the bottom of the vessel, and stir the wheat actively and wash it by rubbing between the hands. After this operation is performed on the evening of the day previous to seeding, the wheat is permitted to remain in the soak all night. On the next morning the wheat is removed from the vessels and placed in baskets, or hampers, to drain for a few minutes, and it is then carried to the barn floor and spread. The driers, such as ashes, lime, or phosphatic float, are then dusted over it. A few shovellings back and forth will soon have the grains coated with the drier and the grain will be ready for use, either by the drill, or broadcast. The water in the vessels is permitted to remain during the day, and when the time comes for soaking another day's supply, a spiggot, which should be as near the bottom of the vessel as possible, is withdrawn, and about half of the water formerly used is suffered to flow out. All

sediment having fallen to the bottom is carried off by the flow of the water. The requisite quantity of fresh water having been added, more salt is put in, and thus the process repeats itself from day to day. If the seeding is interrupted by bad weather, this will make no difference as the wheat which has been soaked and dried by the duster, will keep a week, or more, if it is thinly and evenly spread on a plank floor.

We now present our correspondent's letter defining his views in respect to the prevention of smut:

Editor Southern Planter,—I see that you recommend soaking wheat in salt water as a means of preventing smut, and though disinclined to dispute this assertion (and would not if a mistake of yours would not carry many others wrong) feel called on to state why I disagree. In my first article on smut written some years ago, I reported that the Royal Agricultural Society of England had virtually decided that smut was produced by the ashes or residuum of dead smut grains *adhering* to sound grains, and that either steeping that would kill the smut fungus, or washings that would cleanse the grains, would save the crop; that smutty wheat cleansed or the smut-vitality destroyed by steeping, would bring sound grain, and *vice versa*, the soundest grains rolled in smut would produce a smutty crop.

I also stated that a neighbor asked how I kept clear of smut, and I told him by washing the seed, and the next year he had more smut than usual, and (like a man) reproved me sharply for leading him astray. But upon enquiry I found out that his head man (Spencer, whom you know), had merely soaked the wheat in salt water in a large kettle; and *did not wash it* as he had been directed to do. Upon mentioning this to P. J. Fowlks, then living, he remarked, that his experience in soaking in salt water was similar to Wm. H. Scott's, and that he relied upon blue stone. He also mentioned this fact, that he once rolled pure grains of wheat in smut dust and sowed them in his garden, and they produced a smutty crop. My belief is, that smut is very *soluble in water*; and through this quality may be readily gotten rid of.

I have so long used this way and heard intelligent men and women too do the same to have nice flour free from smell, that I have no doubt of its efficacy; and that now the only difficulty is, the trouble of washing in a plenty of water; which some simple mechanical contrivance would obviate.

Your friend,

SHARPE CARTER.

Having compared our views and experience with those of our correspondent, we may say that both may be wrong, if we are willing to accept the views of the Editor of the *Lancaster (Pa.) Farmer* for November, 1883, and of a correspondent in the same issue. The editorial remarks of the *Farmer* and the communication of its correspondent will be attached hereto, so that all sides may be heard on a vital question in wheat culture.

Lancaster County, Pa., is one of the best wheat districts in the State,

and it would seem that the observations of its intelligent farmers would never place *rust* and *smut* both in the class of *fungoids*. *Smut* is one of the most subtle of fungoids. Its millions of microscopic spores even from one diseased grain which has reached the *puff-ball* condition are sufficient to impregnate many bushels of sound grain. These spores are so minute that if attached to a grain of sound wheat used as seed, they can be taken up by the roots of the plant, and thus, from the earliest growth of the plant, they are a source of insidious disease which attacks the heads of the wheat and effectually destroys them. The views herein presented by our correspondent and ourself, based on a long experience, show that these spores which attach to sound grains may be removed by thorough washing, and is an effectual preventive of smut in a crop raised from grain so washed.

Rust is not a fungoid at all, and its dust has no vitality. It is the result of the bursting of the sap-vessels of the wheat plant by reason of abnormal growth occasioned by an over-supply of heat and moisture, and by too thick seeding on fertile lands, whereby sun-light and air are excluded. The rupture of the sap-vessels first occurs on the leaves of the plant, and if favorable conditions do not occur in time it extends to the stalk. The exudation from the rupture will soon dry up into red dust, something like the rust of iron, and it is therefore called *rust*. The best preventive is thorough drainage, and not too thick seeding on the best lands, and to trust to Providence for favorable conditions of weather after the heading-out of the crop.

SMUT IN WHEAT.

We insert with more than ordinary pleasure the communication of our correspondent from Brookville, because it seems to have a good, intelligent, and practical Lancaster county farmer-ring; and, if Lancaster county farmers would only condescend to make their sentiments freely and liberally known, through the medium of the press, we feel assured that they could honorably occupy the exalted position of *teachers*, instead of mere *freshmen* in agricultural lore. Of course, it is not to be supposed that we officially endorse the doctrines embraced in the various paragraphs we quote from other journals, any more than we are supposed to endorse the sentiments of all our contributors and correspondents. But finding these paragraphs in respectable journals, we suppose them to have a respectable authorship, and hence we give them place for what they may be worth, knowing that if they cannot bear a practical test, they come to naught. According to some of the most unquestionable authorities on the origin and germination of "rust" or "smut," our correspondent is right; nor can we see, any more than he can, how the small *quantum* of sulphate of copper which may adhere to a grain of wheat, can have any beneficial effect upon a disease that is only banefully developed some eight or nine months thereafter. There

is not a more subtle development in the vegetable kingdom than that of mold, smut, or rust, under whatsoever name, or in whatever form it may appear. Its development seems to be entirely under the control of surrounding conditions, and as these conditions cannot be seen six or eight months in advance, it would seem futile to depend on any remedy involved in "seed-planting." These cryptogamic parasites may be found in the "seed cavities" of apples, pears and quinces; in the cells within a loaf of bread, or an English cheese, or within the abdominal cavity of an insect even before it is dead. This would imply that the spores or germs had been in the air, and that their development was entirely dependent upon surrounding conditions, and these conditions would more likely exist in a damp cellar than in a dry garret. Of course, any chemical application that would stimulate the healthy and vigorous growth of a plant, would advance it farther beyond the injury of rust, than if it were in an enervated condition. It is true also that often the most vigorous plants become affected with rust, but then this may occur through excessive stimulation, and a protracted humidity in the surrounding atmosphere.

CORRESPONDENCE ABOUT RUST.

Dr. S. S. Rathvon.—Dear Sir: I see by the *Lancaster Farmer* for October, that some one in the *New York Weekly Times* suggests the propriety of steeping seed in a solution of sulphate of copper and other mixtures containing ammonia, for the prevention of rust and smut on the plants grown from seed so treated. As I see it, I don't go much on such recommendations. The spores or germs of mildew, rust and smut, are afloat in the atmosphere, and take root on any plant that is in a condition to admit of it—that is, in a wet time, when the stems and leaves are soft. These fungi are parasitic in their habits. In foggy weather, nearly all kinds of plants, especially kitchen garden vegetation, are liable to be affected by the growth of these fungi on the different parts of the plant. If it is true that germs take root on these plants by coming in contact with the exterior of the different parts of the different plants, then upon what principle could treating seed in this way do any good? One of the best remedies that I know of is to furnish the soil with such chemical compounds as the plant wants to give its stem a coating of glass, such as cornstocks have. The silicates, especially of potash, furnish what the plant wants to protect itself from the exhausting effects of this growth, white sand and wood ashes furnished the soil is a good application. Remedies for this, as well as for human ailments, consists in assisting nature in its work of protecting itself.

Philosophers have already enumerated more than 150 varieties of these fungi.

The science of Mycology, as the study of these almost microscopic cryptogamous plants (concealed flowers) are called, is one of the most recondite of sciences. When we are advised to do a thing, before we do it we should always first ask ourselves, does it look reasonable, or have we a reason for the faith that is in us?—*C. G., Brookville, Ohio.*

The Southern Planter.


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One-half page..	9 00	25 00	45 00	80 00
One page.....	15 00	40 00	80 00	140 00

COLUMN RATES.

	1 Mon.	3 Mons.	6 Mons.	12 Mons.
One inch.....	\$ 1 50	\$ 4 00	\$ 7 00	\$12 00
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Three inches....	4 00	10 00	20 00	40 00
Half column....	5 00	12 00	25 00	50 00
One column.....	9 00	25 00	45 00	80 00

 Special rates for cover.

 Reading notices, 25 cents per line, of brevier type.

EDITORIAL NOTES

1884 !

May it be a prosperous year for our State and country, and for the *Planter* and its readers!

AN APOLOGY.—Our Editor has been sick, and in bed, for two weeks, during the work on this issue. He has, therefore, been compelled to do *on the sly*—his doctor advising a suspension of mental and physical labor—such work as was necessary. We offer this as an apology for any apparent delinquency of duty.

ADDRESS OF A. J. MCWHITER, ESQ., President of the *Southern Immigration Association of America*, delivered at Vicksburg, Miss., Nov. 21, 1883, before the Cotton Planters' Association of America.

The question of the introduction of immigrants into the South—let them be honest and intelligent laborers, or men of capital for large investments—is one of the greatest importance; and it is well that the expansive minds and patriotic spirit of the leaders of public sentiment are earnestly at work on its solution. Let the States,

4

through their Legislatures, give the Association all the material aid it needs.

INDUSTRIAL SOUTH.—Nothing has distressed us more grievously than the circumstances which made it necessary for the *Industrial South* and the *Planter* to separate their offices. Although we are not now more than the distance of a stone's throw apart, we yet miss much of the intelligent companionship of the Editors of the *South*, which we have enjoyed for several years in the same office-room. It may be best that it is so; for now the *South* has its printing room and office adjoining, which will afford better facilities for the conduct of the most valuable industrial paper of the State.

Remember that the *Industrial South* and the *Planter* are sent for \$2.50 a year to one subscriber to each Journal.

LORD & THOMAS, Advertising Agents; Chicago, Ill.

The receipt of a recent advertisement through this agency reminds us to say at the commencement of a new year that our business relations have been of the most pleasant kind. They are liberal and prompt in their dealings. Their advertising matter is well selected, and they offer nothing which high toned papers would not be willing to accept. They know what printing and paper are worth, and they offer full compensation, and their payments are prompt. No newspaper or journal will be disappointed in respect to any business transacted through this agency. For years it has been marked No. 1 on our books.

SOILS PRACTICALLY CONSIDERED.—Under this title Prof. Page, of the University of Virginia, has forwarded us an interesting and exhaustive article in two parts, the second of which appears in this issue of the *Planter*. It is a subject which every farmer should study by reading and re-reading the Professor's practical views of the subject.

THE ROSE-BUD PEST.—Dry slaked, lime, applied after a rain, or heavy dew.

AN INSECT DESTROYER.—Soft soap, 4 parts; extract of tobacco 6 parts; amylic

alcohol 5 parts; methylic alcohol 20 parts. Extract of tobacco is made by combining equal parts of rolls of tobacco and soft soap, and water is added to make up for what is evaporated. When the soft soap is dissolved, the other ingredients are added.

We regard the above as reliable recipes.

BOOKS, PAMPHLETS, &c.

PEABODY EDUCATIONAL FUND.—Proceedings of the Trustees at their 22d meeting, held at New York 3d October, 1883, with the Annual Report of their General Agent, Dr. J. L. M. Curry.

We are indebted to Dr. Curry for a copy of this interesting document. There are many features of interest we might note, but fail for lack of space; but we cannot refrain copying those paragraphs which refer to unneeded changes in school officers, and the need that efficient men should not feel that their places are dependent on the success or defeat of a political party.

"The frequent change of school-officers—superintendents, and others connected with administrative functions—produces serious inconvenience and sometimes real harm. The value of the work of these men is often not dependent so much on natural cleverness and aptitude, as on the practical experience, acquired habits, knowledge, and expertness which come from acquaintance with a system and the intelligent application of rules. Time is needed to familiarize one with principles and details, to enable him to understand character and scope of duties. All are familiar with the amusing failures to comprehend the operations of a government from merely reading explanatory treatises. The acquired experience or knowledge of a school-officer enhances his qualifications, and his value, not unfrequently, proportionate to the time he has been in office. Rotation deprives the State of official wisdom, familiarity with details, and routine acquaintance with the technique of administration, it begets uncertainty and neglect, and takes away the healthful stimulus of an honest ambition to connect one's name with the education of youth. At the South where public-school systems are novel, and where many intelligent citizens are unfamiliar with their operations, the necessity of permanence in school-officers is greater than in States where such schools have been for generations a part of the daily life.

The evils of rotation are aggravated when changes are the consequence of the varying fortunes of political parties.

Changes are multiplied, and the tendency is to convert the school organization into a political machine for retaining party ascendancy. Instead of the schools and their administration being sacredly kept as the appointed means for educating children, they are subordinated to the irrelevant ends of party success and personal aggrandizement. Instead of being for the *general* weal, the school system may be wickedly perverted to secure the supposed interest of a fraction of the people. It is not easy to imagine a state of things more mischievous, more fatal to "free schools for the whole people," more corrupting, than the degradation of the State-school organization, throughout all its parts, to a party instrument for promoting or ostracizing certain politicians, or effecting certain ends which have not the remotest relation to the instruction of youth.

Such an abuse of trust saps the foundation political ethics, and violates all sound principles of civil service. An officer, instead of discharging duties and relying on capacity and fidelity for retention in his place, considers himself as the servant of the party to which he belongs, and uses his time, influence, and official power for ends quite apart from the efficiency of schools. Cicero said that those officers who take care of one part of the citizens, and disregard or neglect another part, do but occasion sedition and distrust. Any suspicion or fear of the use of the school organization for partisan purposes excites prejudices against or engenders attacks upon the public schools, either the entire system or the details of administration. The party out of power—restive, discontented, ambitious—is easily provoked into open or indirect hostility. If the superintendent or other officers interfere actively in party politics, or use their official power for party ascendancy, attacks will be made on officers, salaries will be reduced, or other means just as effective will be found for crippling the usefulness of the schools. An enlightened and patriotic public sentiment should rigidly confine the school organization to its proper sphere, and lift the free schools out of the arena and the fluctuations of political strife."

ADDRESS of the Commissioner of Agriculture of Alabama, E. C. Betts, and Report of Experimental Station on the subject of *carp* ponds and the management of the fish. It is an interesting and very practical paper.

HORSES: Their feed and their feet; a Manual of Horse Hygiene. Fowler and Wells Publishers, N. Y. city.

SWINE BREEDER'S MANUAL, or how to breed and manage improved swine. Published by the American Berkshire Association, Springfield, Ill.

LANDRETH'S RURAL REGISTER AND ALMANAC FOR 1884.—This firm has been in business 100 years, and they now offer an attractive manual of vegetables, seeds, &c., for the present year.

GODEY'S LADY'S Book.—We call attention to the advertisement of this old and esteemed periodical, as to the terms on which it will club with the *Planter*. We have received the picture called OUR DAISY and it is really a gem. One of these pictures will be given to each subscriber to the *Lady's-Book*, at the regular price \$2 per year, or at the clubbing rate with the *Planter*.

THE PRINCIPLES AND PRACTICE OF VETERINARY MEDICINE. By WILLIAM WILLIAMS, F. R. C. V. S., F. R. S. E., &c., &c. The first American from the last English Edition. Wm. Wood & Co., Publishers, New York, received through Messrs. West, Johnston & Co., this city.

This is evidently a book of great value to every owner and breeder of horses. It is scientific in its researches, but practical in its results. Call on West, Johnston & Co.

ANNUAL REPORT OF DR. R. A. WISE, Superintendent of the Eastern Lunatic Asylum of Virginia. It is an excellent and praiseworthy showing in all Departments of the Institution.

FURMAN'S FARMING: A series of letters on intensive farming, by the late Farish C. Furman, of Georgia. Published by B. F. Avery and Sons, Louisville, Ky.

ADDRESS of the Hon. G. B. Loving, U. S. Commissioner of Agriculture, before the American Forestry Congress, at St. Paul, Minn., Aug. 8, 1883.

SIXTEENTH ANNUAL REPORT, of Ohio State Horticultural Society, for the years, 1882-'83, received with thanks from G. W. Campbell, Esq., Secretary, Delaware, O.

"**THE WEATHER**," a practical guide to its changes, showing the signal service system, and how to foretell local weather. By S. S. Bassler, of the *Commercial Gazette*. Robert Clarke & Co., Publishers, Cincinnati, O.

We have a circular, which is important to Pomologists, from W. J. Beal, Esq., Lansing, Mich., containing the regulations adopted by the *American Pomological Society* in reference to the names of fruit.

ADVERTISEMENTS.

ASHLEY PHOSPHATE COMPANY, have renewed their advertisement for the year 1884. Examine it carefully, and if necessary, correspond with the company who will, with pleasure, answer all enquiries. We have said so much in the *Planter* as to the value of the S. C. Phosphates that we cannot say more in a limited notice of this kind.

A. L. WEST, ARCHITECT.—See his card in this issue. It affords us pleasure to say that we have personally known Mr. West for more than twenty five years, and never knew a more genial gentleman, and one more faithful and competent in his profession. We give our word for it, that whoever engages his services in the country, as we once did, will not regret it. As for Richmond and other leading cities, he is too well known for any commendation from us.

U. S. WIND ENGINE AND PUMP COMPANY.—We invite attention to the advertisement of this company. Wind Engines, or mills, are being rapidly introduced in all sections of the country for various farm and domestic purposes. In the matter of pumping a steady supply of water a wind-mill is invaluable. There is nothing so deliterious to the health and condition of stock as irregular and insufficient watering. The Middle-Virginia practice of riding, or driv-

ing stock to water in a distant stream, and frequently, if not always, omitted in bad weather is a source of great suffering to the animals. Have a well of pure water in the yard, and a tank always supplied, so that the stock can get it at will. A small wind-mill will always keep up a full supply.

COL. S. S. BRADFORD, advertises Merino and other sheep, and cattle. Col. B., is one of the best breeders in the State, and we would advise a correspondence with him by all persons desiring good stock.

THE BLACKSBURG COLLEGE HERD OF SHORT-HORN CATTLE.

The renewal of the advertisement of this Herd enables us to say that it was exhibited at the Roanoke, Lynchburg, and State Fairs of '83 and won 28 premiums. It is probably the best herd of its size in Virginia, and is very creditable to the College and to President Conrad whose skill and attention have secured its perfection. We learn that at the State Fair it was constantly visited by the best judges of cattle in the State, and there was a unanimous verdict of commendation and admiration of the beauty of the animals.

MESSRS. TRACY & DEITZ.—Advertising agents, Philadelphia, have sent us the following.

1. W. H. Smith, Seedsman, Philadelphia.
2. J. T. Lovett, Little Silver, N. J., Early Raspberries, Strawberries &c.

BELMONT STUD AND STOCK FARM.—Our friend Ficklin has sent us a new advertisement of his stock. There is no breeder more reliable, and his Percherons should be everywhere that good draft horses are needed.

MESSRS ALDEN & BRO., Cincinnati, O., send us the Advertisement of J. H. Gregory, Seedman, Marblehead Mass. Mr. G., is as reliable a dealer as the country affords.

It is of the greatest importance to our agricultural friends when seeking for seeds

to plant in 1884, to secure the best that can possibly be produced. Any seed hought of Jas. J. H. Gregory, Seed Grower, Marblehead, Mass., are warranted first-class. Mr. Gregory has been in the seed business for thirty years and has always given satisfaction. If you desire his large complete catalogue of all kinds of seeds, he will send it to you free of charge.

One of the world's recognized standard remedies in Dyspepsia and all Malarial Diseases, is Simmons' Liver Regulator, prepared by J. H. Zelin & Co. Its career has been marked by unparalleled success. It has been extensively introduced into every civilized nation of the earth, and is adapted alike to all ages and conditions of the human race. It is one of Nature's remedies, and is not to be classified with the many quack medicines of the day.

THOMAS M. HAYES & Co., Cincinnati, O.—Dealers in Field and Garden Seeds. See their advertisement.

CHRISTIAN & WHITE.—This old reliable and well-known house renews their advertisements with us for the year 1884. First-class goods at reasonable rates, and courteous attention to all. They are worthy of a continued and increasing patronage.

CONSUMPTION CURED.—An old physician, retired from practice, having had placed in his hands by an East India missionary the formula of a simple vegetable remedy for the speedy and permanent cure of Consumption, Bronchitis, Catarrh, Asthma, and all Throat and Lung Affections; also a positive and radical cure for Nervous Debility and all Nervous Complaints, after having tested its wonderful curative powers in thousands of cases, has felt it his duty to make it known to his suffering fellows. Actuated by this motive, and a desire to relieve human suffering, I will send free of charge, to all who desire it, this recipe, in German, French, or English, with full directions for preparing and using. Sent by mail by addressing with stamp, naming this paper. W. B. Noyes, 149 Power's Block, Rochester, N. Y. jan 8t

Cut This Out & Return to us with TEN CTS. & you'll get by mail A GOLDEN BOX OF GOODS that will bring you in MORE MONEY, in One Month, than anything else in America. Absolute Certainty. Need no capital. M. Young, 133 Greenwich St. N. York.

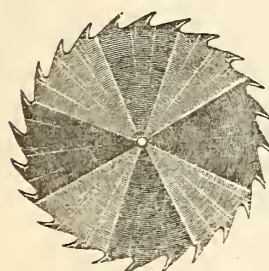
oct 6t

JOSEPH M. BLAIR,

GROCER

803 Main Street (Pace's Block), RICHMOND, VA.

Take pleasure in announcing that he has the Handsomest and Largest Fancy Grocery in the South, occupying three spacious floors, which will be laden at all times with the purest and most seasonable goods. As heretofore, my efforts will be to serve and satisfy the public. No one shall leave my establishment without having full value for every dollar invested. Orders are requested for the purest goods at the lowest prices. Samples sent upon application. Shipments carefully and promptly made.



G. P. HAWES,

(SUCCESSOR TO MILLER & HAWES),

SOUTHERN SAW WORKS,

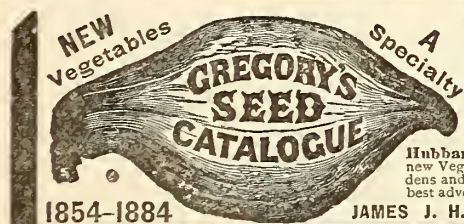
Circular and other Saws, Machinery, Edge Tools,
Tobacco, Straw-Cutter, Book-Binding,
Planer, and Other Knives.

1426 and 1428 Cary Street, Richmond, Va.

Burnt Saws Repaired.

[no 3t]

Special Attention to Repairs of all kinds.



My Vegetable and Flower Seed Catalogue, the result of thirty years' experience as a Seed Grower, will be sent free to all who apply. All seed sent from my establishment warranted to be both fresh and true to name, so far, that should it prove otherwise, I agree to refill orders gratis. My collection of vegetable seed is one of the most extensive to be found in any American catalogue, a large part of it is of my own growing. As the original introducer of Eclipse Beet, Early Ohio, and Burbank Potatoes, Marblehead Early Corn, the Hubbard Squash, Marblehead Cabbage, and a score of other new Vegetables, I invite the patronage of the public. In the gardens and on the farms of those who plant my seed will be found my best advertisement.

JAMES J. H. GREGORY, Seed Grower, Marblehead, Mass.

Jan 3t

BELMONT STUD & STOCK FARM

Was commenced in 1847, and has been continuously improved, and two grazing farms added, with the kind of stock my experience has adopted as best suited to our country's wants. I have bred only from stallions or mares of my breeding or importation, and suited to the wants of any section, and will sell any of above of three years old and over, and in plain, unpampered condition, will let stallions, if not sold on safe business terms, for seasons of 1884. I have bred of several breeds of Cattle, but of late years *only the Pure Shorthorns*, and have all ages for sale, especially young Bulls, Heifers and Calves. I breed only the best Berkshire Swine, and have a number of Boar and Sow Shoats and Pigs for sale; also, White Brahma Fowls and their Eggs. There may be other stock as good, or better, but my experience has settled on these, and I feel that I am doing a public good to forward the propagation of these improved breeds.

S. W. FICKLIN.

Near Charlottesville, Va., Jan. 1st, 1884.

ASTHMA AND HAY FEVER.

THEIR CAUSE AND CURE.

KNIGHT'S NEW BOOK Sent Free.

Address, **L. A. KNIGHT,**
15 East Third Street, CINCINNATI, OHIO.

jan 3t

ALBERT L. WEST ARCHITECT

No. 821 Main St., Richmond, Va.

Drawings furnished for every kind of building and work superintended. ja 3t

CLOUD'S SEEDS Have No Superior. So pronounced by thousands of old customers. To induce new ones to try our Garden Seeds this year, we will send our Special Collection by mail postpaid, for \$1, comprising a Complete Vegetable Garden worth over \$2.25. Send for it now. Our Farm and Garden Annual for 1884 is handsomely illustrated and describes over 1000 new and standard varieties of Field and Garden Seeds, &c. Free to all. Our Novelty List is complete! Our Cash Prizes, Premiums and Offers are amazing! Write at once. Address plainly **Edward P. Cloud, Kennett Square, Chester Co., Pa.**

jan 3t

WM. H. SMITH, SEEDSMAN,

(Late of the firm of HENRY A. BREER),

**WAREHOUSE, 1018 MARKET ST.,
PHILADELPHIA, PA.**

Smith's Seed Catalogue for 1884, containing all the best leading varieties of fresh and reliable Flower, Vegetable, and Field Seeds, also Implements and Garden Requisites, sent free to all applicants.

jan 3t

12806 Lbs. Weight
OF TWO OHIO IMPROVED CHESTER HOGS. Send for description of this famous breed. Also Fowls.
L. B. SILVER, CLEVELAND, O.

jan 1t

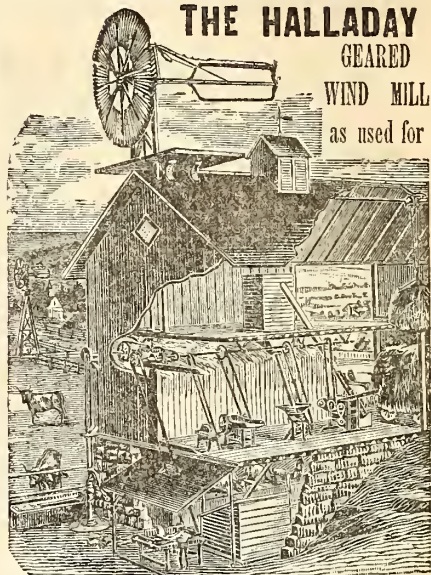
EVERY FARMER HIS OWN MILLER.

THE HALLADAY

GEARED

WIND MILL

as used for



Shelling and Elevating Corn, Grinding Feed, Cutting Hay, Sawing Wood, Pumping Water, etc. Send for Catalogue illustrating the above machinery; also Pumping Wind Mills, Pumps, Tanks, Noyes Haying Tools, Horse Powers, Jacks, &c. Reliable Agents wanted in all unassigned counties.

**U. S. WIND ENGINE & PUMP CO.,
BATAVIA, Kane Co., ILL.**

jan 3t

Lock Box 5.



HANSELL The earliest and most valuable Raspberry, large, bright crimson, very firm, productive, extra hardy North and South. **EARLY HARVEST**, the earliest and most profitable Blackberry. **ATLANTIC & DANIEL** BROWN Strawberries. Send for full particulars; mailed free. The largest and best stock of Strawberries, Raspberries, Blackberries, Gooseberries, Currants, and Grapes in the U.S. Also, Fruit Trees and Nut-bearing Trees, including Kieffer and Le Conte

Pears, the new Peaches—Joann Giant Chestnut, &c. Richly Illustrated Catalogue, with honest descriptions, truthful pictures, and fair prices, free. It tells what to plant, how to plant, and how to get and grow Fruit Trees and Plants; the finest and most useful catalogue of the kind published.

J. T. COVETT, Little Silver, New Jersey.

Introducer Cuthbert Raspberry and Manchester Strawberry.

jan 2t

Christmas the Year Round.

For Babies—Babyland, 50 cents a year.
For Youngest Readers—Our Little Men and Women, \$1.00 a year.
For Boys and Girls—The Pansy, 75 cts. a year.

For the Old and Young Folks—Wide Awake, \$2.50 a year. 32 Page Illustrated. Premium List Free. Address,

D. LOTHROP & CO., Boston, Mass.

[jan 1t]

— IT CURES —

SPAVINS, SPLINTS, CURBS, RING-BONES

AND

All Similar Blemishes.

AND REMOVES THE BUNCH WITHOUT BLISTERING.



For man it is now known to be ONE OF THE BEST, if not THE BEST LINIMENT EVER DISCOVERED.

The *most successful remedy* ever discovered, as it is certain in its effects, and does not blister. Also excellent for human flesh. Read proof below:

[From the AKRON COMMERCIAL, Ohio, of November 25th, 1882.]

Readers of the *Commercial* cannot well forget that a large space has for years been taken up by Kendall's advertisements—especially of a certain Spavin Cure. We have had dealings with Dr. Kendall for many years, and we know of some large business houses in cities near by, who have also dealt with him for many years, and the truth is fully and faithfully proven, not only that he is a good honest man, and that his celebrated Spavin Cure is not only all that it is recommended to be, but that the English language is not capable of recommending it too highly.

Kendall's Spavin Cure will cure spavins. There are hundreds of cases in which that has been proven to our certain knowledge, but, after all, if any person confines the usefulness of this celebrated medicine to curing spavins alone, they make a big mistake. It is the best medicine known as an outward application for rheumatism in the human family. It is good for pains and aches, swellings and lameness, and is just as safely applied to men, women and children as it is to horses. We know that there are other good liniments, but we do believe this Spavin Cure to be far better than any ever invented.

Send address for Illustrated Circular which, we think, gives positive proof of its virtues. No remedy has ever met with such unqualified success to our knowledge, for beasts as well as man.

Price, \$1 per bottle, or six bottles. All druggists have or can get it for you, or it will be sent to any address, on receipt of price, by the proprietors.

Dr. B. J. KENDALL & CO., Enosburgh Falls, Vermont.

FRANKLIN DAVIS.

EDWARD H. BISSELL.

RICHMOND NURSERIES. **FRANKLIN DAVIS & CO.**

400 Acres in Nursery Stock! 100 in Orchards! 100 in Small Fruits!

We offer to our customers an immense stock of APPLES, PEACHES, CHERRIES, APRICOTS, GRAPES, &c.—all the standard sorts. Also, the new varieties of FRUITS, ORNAMENTAL TREES, SHRUBS, ROSES, &c., Wholesale and Retail. To dealers we can offer stock on favorable terms, and the best facilities for packing and shipping. Catalogues mailed on application.

FRANKLIN DAVIS & CO.,

sep 6t

Office: 1013 Main St., RICHMOND, VA.

BECKWITH'S ANTI-DYSPEPTIC PILLS

The best and most reliable Anti-Dyspeptic Medicine ever offered to the Public.

For more than seventy years this medicine has maintained its high reputation. No remedy was ever offered to the public sustained by such forcible certificates of wonderful remedial properties. Presidents of the United States, Judges of the Supreme Court, Governors of States, United States Senators and Physicians of the highest standing are among those who attest their value from personal tests.

E. R. Beckwith, Pharmacist, now manufactures these invaluable pills from the Original Recipe of his grandfather, Dr. John Beckwith.

40 Pills in a Box—Price, 25 Cents.

Sufferers from DISORDERED STOMACH or DERANGED LIVER, with their attendant complications, will find relief from these pills. SOLD BY DRUGGISTS GENERALLY.

E. R. BECKWITH, Pharmacist.

fe tf

Cor. Market and Halifax Sts., Petersburg, Va.

CHESAPEAKE AND OHIO RAILWAY

—FROM—

CINCINNATI, LOUISVILLE and
COLUMBUS, OHIO,

—TO—

CLIFTON FORGE, STAUNTON,
CHARLOTTESVILLE, and
RICHMOND, VA.

LAND BUYERS and parties from the
West and Northwest, who are looking for
New Homes in the mild climate of Virginia
and the Carolinas, will find the

Chesapeake and Ohio Railway
the only direct route to Virginia.

Call on Agents of the Seneca Route,
Chicago, Rock Island and Pacific.

J. H. MARTIN, General Agent, Indian-
apolis, Ind.

Or following Agents of C. and O. Ry. :

W. P. FOSTER, 108 N. Third Street, St.
Louis, Mo.

FRANK W. BUSKIRK, 171 Walnut St.,
Cincinnati, O.

J. J. ARCHER, Gen. Pass. Agent, Scioto
Valley Railway, Columbus, O.

H. W. FULLER,
General Passenger Agent.

C. W. SMITH,
General Manager, Richmond, Va.

SEEDS

Clover, Timothy, Orchard-grass, Bluegrass, Red Top,
Hungarian, Millet, Seed Oats, Seed Rye, Seed Barley,
Garden Seeds, etc. Orders accompanied by money or
post-office order filled at lowest market price. Send
for seed catalogue.

SHERMAN & CO.,
Nos. 234 & 236 Sixth St., Louisville, Ky.
Jan 31

1884 SEEDS

Farmers will find it to
their interest to plant
our Early Seed
Corn, Potatoes and
Garden Seeds this
coming Spring. For 50 cents in 2 cent
stamps we will send to any address, by
mail prepaid, 2 pounds either variety se-
lected seed corn, Mammoth Yellow King,
Golden Yellow, Chester Co. Yellow, Leam-
ing, Normandy White, Champion White or
White Pearl. From the above varieties
we have received better reports the past
two years, and more first premiums than
any house in the U. S. Price for either
variety by express or freight, purchaser to
pay all charges, 1 peck, 75 cents; 1 bushel,
\$2.40; 2 bushels, \$4.50; 5 bushels, \$10.00;
sample any variety, 10 cents. Satisfaction
guaranteed. (Catalogue free.)

THOS. M. HAYES & CO.,
Cincinnati, O.

Jan 6t

THIS PAPER
IN CLUB WITH

GODEY'S LADY'S BOOK

will be sent for one year to any address on re-
ceipt of \$2.50, which should be sent to the pub-
lisher of the *Southern Planter*.

GODEY'S LADY'S BOOK

is recognized as the leading fashion and home maga-
zine in America. The leading attractions for 1884
are the following:

24 Beautiful Colored Fashion Plates
executed by the French process, represent-
ing the prevailing fashions in both style and color,
produced especially for and published exclusively in
Godey's Lady's Book.

12 Engraved Plates of Fashion in black
and white, illustrating leading styles.

12 Finely Executed Steel Engravings
by the best artists, made for Godey's Lady's
Book.

12 Engraved Portraits of Ex-Presi-
dents of the U. S., which form a part of
what is known in Godey's Lady's Book as the

Presidential Portrait Gallery,

each being accompanied by a short biographical
sketch.

150 Pages, Illustrating Fashions and
fancy needle work.

12 Pages of Architectural Designs,
showing plans and perspective of Houses
and Cottages of all descriptions.

12 Full Size Cut Paper Patterns, with
full and explicit instructions for use.

200 Godey's Lady's Book Celebrated
household cooking receipts, each having
been tested by practical housekeepers before pub-
lishing.

24 Pages of Sheet Music.

BESIDES embracing a rich array of literature,
Novels, Novelettes, Stories and Poems, by eminent
writers, among whom are MARION HARLAND, CHRIS-
TIAN REED, ELLA RODMAN CHURCH, AUGUSTA DE
RUENA, Mrs. SIEFFEY PETERS, HELEN MATHERS,
Author of "Cherry Ripe."

The Art Department will be under the direc-
tion of Wm. MacLeod, Curator of Corcoran Gallery
of Art, Washington, D. C. All other departments
under equally competent direction.

Subscription Price, \$2.00 per Year.

For further information send for circular. Sam-
ple copy of Godey's Lady's Book, 15c. Stamps
taken. To avoid errors write plainly your address,
giving county and State.

GODEY'S LADY'S BOOK,

1006 Chestnut St., Philadelphia, Pa.

HONEY BEES!

The New System of Bee-Keeping.

Every one who has a Farm or Garden can keep
Bees on my plan with good profit. I have invented
a Hive and New System of Bee Management, which
completely changes the whole process of Bee-Keep-
ing, and renders the business pleasant and profitable.
I have received One Hundred Dollars Profit, from
sale of Box Honey from One Hive of Bees in one
year. Illustrated Circular of Full Particulars Free.
Address Mrs. LIZZIE E. COTTON, West Gorham,
Maine. nov 4t

BROWN'S GEORGIA FEED CUTTER.

This machine is constructed on an entirely different principle from any other Feed Cutter in use, and is unequalled in three essentials, viz.:

RAPID WORK, STRENGTH, AND FACILITY IN SHARPENING THE CUTTERS.

They are made for both hand and power, and surpass any other machine for light running. It cuts cornstalks, ensilage, hay and straw with equal facility.

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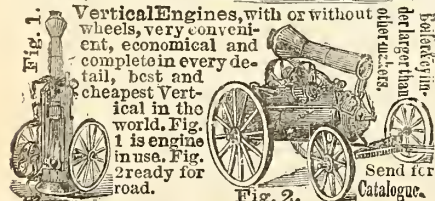
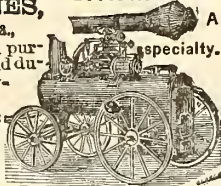


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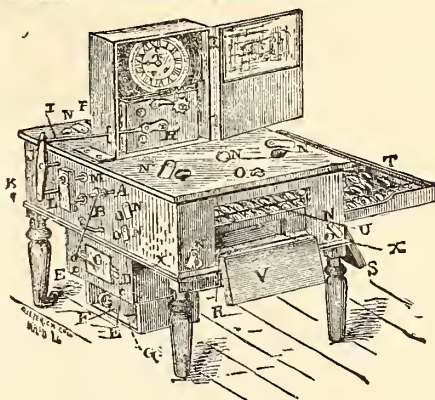
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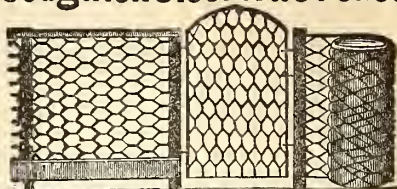
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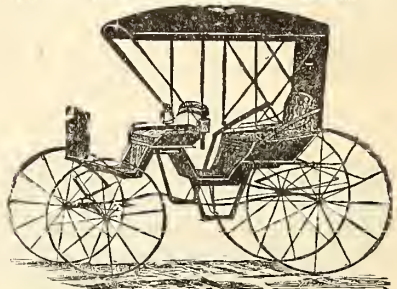
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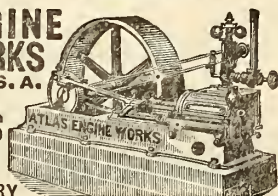
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This guano is found in the Orchilla Island, in the Carribbean Sea, and comes to us direct by vessels, and all we do to it on arrival is to screen out the lumps and bag it. Every cargo is analyzed before leaving the Island, and comes guaranteed to us to contain from 40 to 50 per cent. of Bone Phosphate of Lime, and other valuable ingredients.

THE CHEMISTS ENDORSE IT.

The Department of Agriculture of the State of Virginia, under the administration of Dr. J. M. Blanton, have recently undertaken the analysis of every brand of Fertilizer, sold in the State. The Report of the work done in that respect, by Prof. W. I. GASCOYNE, the well known Chemist of the Department, during the Fall Season of 1882, has just been published. It embraces the analysis of *seventy-five* different brands of Fertilizers, and certifies to the *actual value* of their several constituents as developed by the analysis. A reference to this Report exhibits the following remarkable results:

1. The actual value of most of these Fertilizers falls *below* the prices asked for them!
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3. In the case of ORCHILLA GUANO, the certificate of the chemist is "**Actual value \$41.12,**" which is *more than 50 per cent.* over the price asked for it!

This official statement is only corroborative of similar results, furnished us privately by other chemists of high reputation in Virginia and elsewhere; notably Prof. Mallet, Dr. Dabney, Prof. Taylor and others. According to Dr. Dabney, the cash value of the sample analyzed by him, was \$43.97. Prof. Taylor's, by the same calculation, was \$44.32.

We are permitted to copy a portion of a private letter from PROF. JOHN R. PAGE, of the University of Virginia, as to practical results:

UNIVERSITY OF VIRGINIA, January 23, 1883.

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Yours, &c.,

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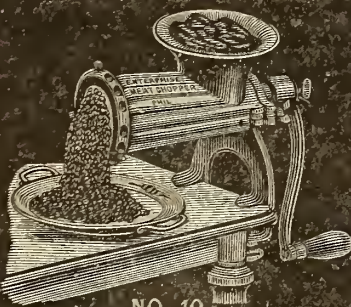
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NEW
MEAT CHOPPER.

FARMERS!!

FOR CHOPPING

Sausage Meat, Mince Meat, Suet,
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Cabbage, Peppers, Salad,
Scrap Meat for Poultry, &c.

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NO. 10,
FAMILY SIZE.
PRICE, \$3.00.

NO STRINGS OR SINEWS CAN PASS THROUGH UNCHOPPED.

CAPACITY.
No. 10, chops 1 lb. per minute, \$3.00
" 22, " 2 lbs. " 4.00
" 32, " 3 " 6.00
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for Pork only, 10.00

The American Agriculturist Sept. Number says, "We have given this Meat Chopper a thorough trial, with most satisfactory results."

Sold by all Hardware Dealers. AGENTS. Send for Terms.



WHEN YOU PLOW GET ON TRIAL THE WATT CHILLED

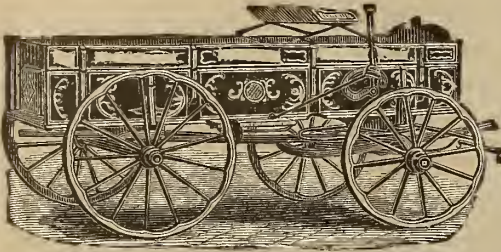
THEY ARE SUPERIOR IN EVERY ESSENTIAL OF

STRENGTH, DURABILITY, ECONOMY, LIGHT DRAUGHT,

PERFECT BURIAL OF VEGETATION, THOROUGH DISINTEGRATION OF THE SOIL, FREEDOM FROM CHOKING. Warranted to be as represented, and sold subject to approval by trial. Return at our expense if not satisfactory.

WATT No. D E and No. A B Jr. PLOWS are the favorites in the Cotton States. They are the only perfect combined *Turning and Cultivating Plows made*. The **BEST** and the **CHEAPEST** for Corn, Cotton, Tobacco and Vegetables.

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made of the best material and finished in the most attractive manner. We are prepared to furnish at prices as low as any first-class Wagon can be sold. Every Wagon warranted for twelve months. All expecting to purchase Wagons will find it to their interest to examine our stock and prices.

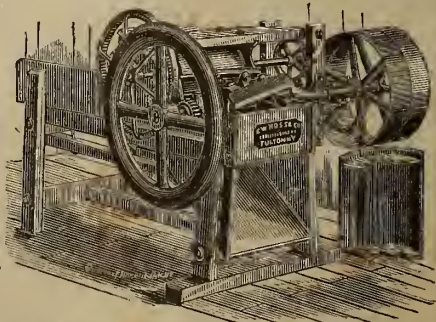
CORN SHELLERS


for **HAND** or **POWER**, separating Corn from Cob, and guaranteed to shell clean. **FAN ATTACHMENTS** for blowing out chaff and dust.

ROSS GIANT ENSILAGE CUTTERS

HAVE RECEIVED over **240 MEDALS**
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Successful at every competing trial at cutting. Will do more work with less power than any other Cutters made. **THIS WE GUARANTEE**, and warrant every one to give satisfaction. We furnish these Cutters with a capacity of **TEN TONS per HOUR** down to fodder cutters of one-man power. We can meet the varied wants and tastes of all, in size, price and make.



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